969896

TETRA TECH

July 22, 2021

Craig Thomas
On-Scene Coordinator
U.S. Environmental Protection Agency Region 5
Superfund and Emergency Management Division
77 W Jackson Blvd
Chicago, IL 60604

Subject: **Data Validation Reports**
Chemtool Fire Site - RS
EPA Contract No.: 68HE0519D0005
Task Order/Task Order Line Item No.: 103X90310032/0001CF104
Document Tracking No. 0754

Dear Mr. Thomas:

Tetra Tech, Inc. (Tetra Tech) is submitting these data validation reports for one solid sample and 3 aqueous samples (one of which was analyzed as a solid sample) collected at the Chemtool Fire site. The samples were collected on June 18 and 19, 2021, and were analyzed for perfluorinated alkyl substances, metals, mercury, volatile organic compounds, and semivolatile organic compounds by Eurofins TestAmerica. The final laboratory data package was received on June 22, 2021.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines for Organic Superfund Methods Data Review* (January 2017), and EPA *National Functional Guidelines for Inorganic Superfund Methods Data Review* (January 2017).

Some results were rejected as noted in the data validation reports. Based on the findings of this validation effort, all remaining results may be used as qualified in these reports.

If you have any questions regarding these data validation reports, please call me at (509) 688-5957.

Sincerely,

Deb Kutsal
Senior Chemist

Enclosure
cc: Chris Burns, Tetra Tech Program Manager
Cordell Renner, Tetra Tech Project Manager
Connie Rodriguez, Tetra Tech Project Document Control Coordinator
TO-TOLIN File

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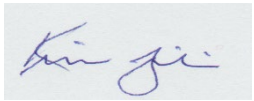
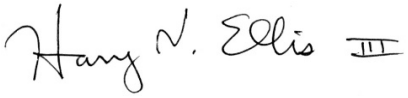
ATTACHMENT 1

DATA VALIDATION REPORT
EUROFINS TESTAMERICA REPORT NO. 500-201158-1, 500-201159-1, 500-201159-2 AND 500-201178-1

DATA VALIDATION CHECKLIST – STAGE 3

Site Name	Chemtool Fire Site - RS	**Project No.**	103X903100320001CF104
Document Tracking No.	0754A		
Data Reviewer (signature and date)	 June 27, 2021	**Technical Reviewer (signature and date)**	 20 July 2021
Laboratory Report No.	500-201158-1	**Laboratory**	Eurofins TestAmerica / University Park, IL
Analyses	Perfluoroalkyl Substances (PFAS) by EPA Method 537 (modified)		
Samples and Matrix	1 solid sample		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 3 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Organic Superfund Methods Data Review* (January 2017), and the cited analytical method.

OVERALL EVALUATION

No rejection or qualification of results was required for this data package. The results may be used as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

DATA VALIDATION CHECKLIST – STAGE 3

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	The sample label was placed on the ziplock bag instead of on the sample container. The laboratory confirmed that the information on sample label matched information on chain-of-custody (COC) form. No qualifications were applied.

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
NA	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
Y	

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
Y	

DATA VALIDATION CHECKLIST – STAGE 3

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
N	The recovery of M2 8:2 FTS exceeded the QC limits for sample RCF-TR-1-210618 and the matrix spikes, apparently due to interference caused by the high concentration of 6:2 FTS in the sample. Target compound 8:2 FTS is nondetect, therefore, no qualifiers were applied.

MS/MSD:

Within Criteria	Exceedance/Notes
Y	The recovery of 6:2 FTS exceeded the control limits, however, the amount of 6:2 FTS in the parent sample (RCF-TR-1-210618) exceeded 4× the spiked concentration. No qualification was applied.

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

DATA VALIDATION CHECKLIST – STAGE 3

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	The sample was analyzed at a 10× dilution for all target analytes in order to report target compound 6:2 FTS within linear range.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

DATA VALIDATION CHECKLIST – STAGE 3

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Sample results were verified; results were found to be acceptable. Refer to calculation verifications. Nondetects are reported at the RL.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

System performance and instrument stability:

Within Criteria	Exceedance/Notes

NA	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 500-201158-1-Mod 537

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
Initial Calibration	Confirm (in raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).	**Instrument A13** **6/15/2021** **12:31-13:28** **7-point calibration**	**See calibration spreadsheet**
	Confirm (in raw data) that an initial calibration occurs at the required frequency.	**Yes**	
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.		**Calculated RRF: See calibration spreadsheet**
			Calculated $\overline{RRF}$: See calibration spreadsheet
			Calculated %RSD: See calibration spreadsheet
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**			
Tune	Confirm DFTPP Percent Relative Abundance	**N/A**	

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: __500-201158-1-Mod 537

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
ICV	Check result	**6/15/2021 13:47**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %R		
A CCV applicable to our samples	Check result	**6/19/2021 16:57**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %D		
Method Blank	Check result	**6/19/2021 18:31**	**ND**
Surrogate	Recalculate one %R	**RCF-TR-1-210618 6/20/2021 18:10**	**M262FTS reported 125% 0.1482/0.119*100=125%**
MS	Check result	**N/A**	
	Recalculate one %R	**N/A**	
MSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between MS and MSD	**N/A**	

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: __500-201158-1-Mod 537

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
LCS	Check result	**6/19/2021 18:40**	**See calibration spreadsheet.**
	Recalculate one %R	**PFHxA reported 2.0%**	**2.0/2.0*100=100%**
LCSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between LCS and LCSD	**N/A**	
Internal Standards	Recalculate one %R	**13PFOA**	**356980*10/3644847*100=97.9%**
	Recalculate one delta RT	**13PFOA**	**3.93-3.93=0.00 min. difference**
Sample Result for 6:2 FTS	Check result	**RCF-TR-1-210618 6/20/2021 18:10 10X**	**(2.17 quant sheet) (10 fv/((0.1.17gm)(0.634434%solid)))*10 = 292 ug/kg**
MDL for __6:2 FTS	Check result	**reported 10 ug/Kg**	**nominal MDL 0.15 ug/Kg 0.15*10*1/0.7423 (1.17gm(%solid 0.6344))=2.02 ug/Kg**
RL for __6:2 FTS_____	Check result	**reported 130 ug/Kg**	**nominal RL 2.0 ug/Kg 2.0*10*1(1.17gm(%solid 0.6344))=14.8 ug/Kg**
Convert µg/m^3 to ppbV (air only) for _____	Check result	**N/A**	

537	
6:2 FTS	water

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
0.0237	54201	1.19	803880	0.08
0.0474	89218	1.19	802066	0.13
0.2370	423651	1.19	791831	0.64
0.9480	1516755	1.19	744600	2.42
2.3700	3664970	1.19	683175	6.38
4.7400	5780714	1.19	546077	12.60
9.4800	9327498	1.19	445549	24.91

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	22.15%	3.13%	6.72%	28.42%	-16.79%	46.58%
	0.76%	-6.27%	-4.94%	5.94%	-16.60%	14.15%
	-3.07%	0.33%	-0.31%	1.91%	-2.47%	1.92%
	-7.74%	-2.63%	-3.60%	-3.00%	-3.98%	-4.30%
	-2.81%	3.00%	1.90%	2.18%	1.89%	0.85%
	-4.11%	1.76%	0.65%	0.82%	0.75%	-0.02%
	-5.18%	0.68%	-0.42%	-0.31%	-0.26%	-0.01%
RSE in X:	10.1%	3.7%	4.2%	12.0%	10.8%	24.5%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r^2	r
Weighted (1/Amt^2)						
Average		2.7715E+00		0	0.99731	0.99866
Linear	1.6485E-02	2.6083E+00		-0.01	0.99977	0.99989
Weighted (1/Amt)						
Linear	1.3519E-02	2.6377E+00		-0.01	0.99992	0.99996
Unweighted						
Forced Zero		2.6361E+00		0	0.99995	0.99998
Linear	2.8330E-02	2.6319E+00		-0.01	0.99993	0.99996
Quadratic	-1.3294E-02	2.6925E+00	-6.6478E-03	0.00	0.99997	0.99998
	c	b	a			

Sample Results

	-2	LCS	ICV	CCV	
Instrum.Responses:	4212684	917866	5344384	53939	
IS Response:	83398	431521	554380	524939	
Avg RF Result:	21.689	0.913	4.139	0.044	#DIV/0!
Linear(1/x2) Result:	23.039	0.964	4.392	0.041	#DIV/0!
Linear(1/x) Result:	22.784	0.955	4.344	0.041	#DIV/0!
Linear Forced:	22.803	0.960	4.352	0.046	#DIV/0!
Linear Result:	22.829	0.951	4.348	0.036	#DIV/0!
Quad Result (no IS):					
Quad Result (with IS):	23.719	0.947	4.312	0.050	#DIV/0!

(2.17 quant sheet) (10 fv/((0.1.17gm)(0.634434%solid)))*10 = 292 ug/kg reported 290 ug/kg

CHEMTOOL FIRE SITE - RS SOIL ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201158-1

Sample ID	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	Perfluorobutanoic acid (PFBA)	1.9	U	1.9	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluoropentanoic acid (PFPeA)	5.2	U	5.2	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorohexanoic acid (PFHxA)	3.9	J	2.8	13	ug/Kg	3.9	J
RCF-TR-1-210618	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.0	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorooctanoic acid (PFOA)	5.8	U	5.8	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorononanoic acid (PFNA)	2.4	U	2.4	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorodecanoic acid (PFDA)	1.5	U	1.5	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluoroundecanoic acid (PFUnA)	2.4	U	2.4	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorododecanoic acid (PFDoA)	4.5	U	4.5	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorotridecanoic acid (PFTriA)	3.4	U	3.4	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorotetradecanoic acid (PFTeA)	3.6	U	3.6	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorobutanesulfonic acid (PFBS)	1.7	U	1.7	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluoropentanesulfonic acid (PFPeS)	1.3	U	1.3	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorohexanesulfonic acid (PFHxS)	2.1	U	2.1	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluoroheptanesulfonic Acid (PFHpS)	2.4	U	2.4	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorooctanesulfonic acid (PFOS)	13	U	13	34	ug/Kg	34	U
RCF-TR-1-210618	Perfluorononanesulfonic acid (PFNS)	1.3	U	1.3	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorodecanesulfonic acid (PFDS)	2.6	U	2.6	13	ug/Kg	13	U
RCF-TR-1-210618	Perfluorooctanesulfonamide (FOSA)	5.5	U	5.5	13	ug/Kg	13	U
RCF-TR-1-210618	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	26	U	26	130	ug/Kg	130	U
RCF-TR-1-210618	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	25	U	25	130	ug/Kg	130	U
RCF-TR-1-210618	4:2 FTS	25	U	25	130	ug/Kg	130	U
RCF-TR-1-210618	6:2 FTS	290		10	130	ug/Kg	290	
RCF-TR-1-210618	8:2 FTS	17	U	17	130	ug/Kg	130	U
RCF-TR-1-210618	HFPO-DA (GenX)	7.4	U	7.4	17	ug/Kg	17	U
RCF-TR-1-210618	F-53B Major	1.8	U	1.8	13	ug/Kg	13	U
RCF-TR-1-210618	F-53B Minor	1.5	U	1.5	13	ug/Kg	13	U
RCF-TR-1-210618	DONA	1.2	U	1.2	13	ug/Kg	13	U

DATA VALIDATION CHECKLIST – STAGE 3

Site Name	Chemtool Fire Site - RS	**Project No.**	103X903100320001CF104
Document Tracking No.	0754B		
Data Reviewer (signature and date)	July 7, 2021 7/5/2021	**Technical Reviewer (signature and date)**	20 July 2021
Laboratory Report No.	500-201159-1	**Laboratory**	Eurofins TestAmerica / University Park, IL
Analyses	Metals by EPA Method 6020A; Mercury by EPA Method 7470A; Volatile organic compounds (VOC) by EPA Method 8260B; Semivolatile organic compounds (SVOC) by EPA Method 8270D		
Samples and Matrix	1 water sample		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 3 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017), the *NFG for Organic Superfund Methods Data Review* (January 2017), and the analytical methods cited above.

OVERALL EVALUATION

Five EPA Method 8270D results were rejected for calibration RRFs below control limits. The remaining results may be used as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

DATA VALIDATION CHECKLIST – STAGE 3

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	The chain-of-custody (COC) form requests "6020 TAL metals + lithium". The laboratory additionally performed and reported mercury by EPA Method 7470A, which was reviewed for this validation report. It should be noted that the COC form does not specify preservation. The case narrative states that the samples were received properly preserved. It should also be noted that the COC form included in the laboratory report is designated for CT Laboratories.

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	EPA Method 6020A: For the Agilent instrument (ICPMS4) used to analyze samples for metals, the laboratory checked the tune of the instrument according to the laboratory's standard operating procedure (SOP). The SOP specifies checking the tune in helium (He) mode using the masses 59, 89, and 205, and checking the tune in no gas mode using the masses 7, 89, and 205. The He mode was used to determine the analyte concentrations in the sample. As such, the validator expressed concern that the tune in He mode did not include mass 7, which would have extended the tune check down into the range of masses characteristic of some of the low-mass target analytes. The laboratory was contacted about this concern and responded by providing the aforementioned laboratory SOP. Because the laboratory conducted the tunes according to the lab SOP, no qualifications of sample results for analytes of low atomic mass were considered warranted. This circumstance potentially affects lithium, beryllium, boron, sodium, magnesium, aluminum, potassium, calcium, titanium, vanadium, chromium, manganese, and iron.

Initial Calibration:

Within Criteria	Exceedance/Notes
N	EPA Method 8270D: Initial calibration average RRFs were below method control limits for the following compounds: bis(2-chloroethoxy)methane, isophorone, nitrobenzene, and N-nitrosodi-n-propylamine. Sample results, all nondetects, were rejected (flagged R).

DATA VALIDATION CHECKLIST – STAGE 3

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The %D exceeded the control limit of ≤20% with a low response for 1,1,2,2-tetrachloroethane (-20.4%). The nondetect sample result was qualified as estimated (flagged UJ). EPA Method 8270D: Continuing calibration RRFs were below method control limits for the following compounds: bis(2-chloroethoxy)methane, bis(2-chloroethyl)ether, isophorone, and n-nitrosodi-n-propylamine. Sample results, all nondetects, were rejected (flagged R). The continuing calibration %Ds exceeded the control limit of ≤20% with high responses for 4-nitrophenol (56.7%), bis(2-ethylhexyl)phthalate (32.3%), and butyl benzyl phthalate (22.7%), and a low response for benzaldehyde (-43.5%). Results, all nondetects, were qualified as estimated (flagged UJ).

Calibration Verification:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The %D exceeded the control limit of ≤20% with a high response for dichlorodifluoromethane (23.8%). The nondetect sample result was qualified as estimated (flagged UJ). EPA Method 8270D: ICV RRFs were below method control limits for the following compounds: bis(2-chloroethoxy)methane, isophorone, and n-nitrosodi-n-propylamine. Sample results, all nondetects, were rejected (flagged R).

Method blanks:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The method blank had a detect below the RL for benzene (0.219 µg/L). The sample result (1.4 µg/L) above the RL was <10× the method blank concentration and was therefore qualified as estimated with a potential high bias (flagged J+). EPA Method 6020A: Lithium was present in a bracketing calibration blank at greater than the MDL. The associated sample result was >10× the blank concentration and was not qualified. It should be noted that negative values were not reported in the QC summaries or raw data for instrument ICPMS4; therefore, negative blank values could not be evaluated against the sample results for all target analytes except nickel.

DATA VALIDATION CHECKLIST – STAGE 3

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	EPA Method 8270D: The surrogates were diluted out of the sample and were therefore not evaluated.

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

DATA VALIDATION CHECKLIST – STAGE 3

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	EPA Method 8270D: According to the case narrative and preparation bench sheet for this SDG, due to the nature of the sample matrix, a greatly reduced sample volume was extracted (5 mL instead of 250 mL) and the sample was further diluted 20-fold for analysis, resulting in an effective 1000-fold dilution. Reporting limits and MDLs were raised accordingly. EPA Method 6020A: The sample was diluted ten-fold at preparation for all analytes. The sample was diluted a further five-fold for titanium.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

DATA VALIDATION CHECKLIST – STAGE 3

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
Y	

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	EPA Method 8270D: The COC form specifies "8270 SVOC (PAH) TIC"; however, the laboratory analyzed for 65 SVOCs by Method 8270D. All detected sample results are PAHs.

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	All methods: The following inconsistencies were noted. Nondetects were reported at the RL in the laboratory report and at the MDL in the EDD. The reviewer further noted for EPA methods 8260B and 8270D that sample results in the laboratory report are reported in units of µg/L and in the EDD in units of mg/L. EPA Method 6020A: It should be noted that negative values were not reported in the QC summaries or in the raw data for instrument ICPMS4; therefore, negative values could not be evaluated against the MDLs for all target analytes except nickel.

DATA VALIDATION CHECKLIST – STAGE 3

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The laboratory reported ten TICs for sample RCF-TR-1-210618; however, named TICs with corresponding calibration were quantitated using the initial calibration average response factor and specific ion peak rather than a response factor of 1.0 with a total ion peak, and included n-butanol, ethanol, 2-methyl-2-propanol, and naphthalene. Although more accurate results, as the compounds reported using the calibration had no corresponding QC data (MB, LCS/LCSD) and calibrated results for n-butanol and ethanol exceeded the linear range of the calibration, these named TIC compounds and those TICs identified as unknowns were qualified as estimated (flagged J). Remaining named TICs were qualified as tentatively identified and estimated (flagged NJ). EPA Method 8270D: TICs identified as unknowns were qualified as estimated (flagged J) and named TICs were qualified as tentatively identified and estimated (flagged NJ).

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

DATA VALIDATION CHECKLIST – STAGE 3

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201159-1 6020A_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Initial Calibration	Confirm (in ICP raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).			
	Confirm (in ICP raw data) that an initial calibration occurs at the required frequency.			
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**06212021 10:58**	**blank plus three non-zero standards. See 500-201159-1 silver ICAL worksheet.**	✓
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**				
ICV	Check result **cobalt**	**06212021 11:15**	**rpt: 206 ug/L raw: 206.4**	✓
	Recalculate one %R	**rpt:103%**	**Calculated result:***206.4/200 = 103.2%**	✓
ICB	Check result **selenium**	**06212021 11:19**	**rpt: <2.5 ug/l raw: <0.000**	✓
CRDL Check Standard	Check result **lead**	**06212021 11:33**	**rpt:1.07 ug/l raw: 1.072**	✓
	Recalculate one %R	**rpt: 107%**	**Calculated result:*** 1.072/1 = 107%**	✓
An opening CCV applicable to our samples	Check result **thallium**	**06212021 12:25**	**rpt:255 ug/l raw: 254.9**	✓
	Recalculate one %R	**rpt: 102%**	**Calculated result:*** 254.9/250 = 102%**	✓
A closing CCV applicable to our samples	Check result **chromium**	**06212021 13:00**	**rpt:260 ug/L raw: 257.9**	✓
	Recalculate one %R	**rpt: 104%**	**Calculated result:*** 257.9/250 = 103.2%**	✓
An opening CCB applicable to our samples	Check result **lithium**	**06212021 12:29**	**rpt:<2.0 ug/l raw: 0.103**	✓
A closing CCB applicable to our samples	Check result **arsenic**	**06212021 13:03**	**rpt: <1.0 raw: 0.012**	✓
Method blank	Check result **barium**	**06212021 12:32**	**rpt: <0.0025 mg/l raw: 0.0002 mg/l**	✓
	recalculate result		**Cacluated result: NA**	

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201159-1 6020A_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
ICSA sample	Check result **cadmium**	**06212021 11:26**	**rpt: 0.283 ug/l** **raw: 0.283 ug/l**	✓
	Recalculate one %R	**NA**	**Calculated result:*** NA**	
ICSAB sample	Check result **cadmium**	**06212021 11:29**	**rpt: 20.0 ug/l** **raw: 19.99**	✓
	Recalculate one %R	**rpt: 100%**	**Calculated result:*** 19.99/20 = 100%**	✓
MS	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:****	
MSD	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:****	
	Recalculate one RPD value between MS and MSD		**Calculated result:**	
Post-digestion spike	Check result	**NA**		
	Recalculate one %R		**Calculated result:****	
LCS	Check result **chromium**	**06212021 12:36**	**Calculated result:* NA** **rpt: 0.208 mg/l** **raw: 208.2 ug/l**	✓
	Recalculate one %R	**rpt: 104%**	**Calculated result:***208.2/200 = 104.1%**	✓
Serial Dilution	Check result	**NA**	**Calculated result:****	
	Recalculate one percent difference value		**Calculated result:**	
Sample result for selenium	Check result rpt: <0.025mg/l	**06212021 12:56**	**Calculated result: NA** **raw: 0.159 ug/l**	✓
Sample result for magnesium	Check result rpt: 97mg/l	**06212021 12:56**	**Calculated result: NA** **raw:9716 ug/l**	✓
RL for beryllium	rpt: 0.01 mg/l	**RCF-TR-1-210618**	**Calculated result:{0.001} * {50/5} = 0.01 mg/l**	✓
MDL for beryllium	rpt: 0.0053 mg/l	**RCF-TR-1-210618**	**Calculated result:{0.00053} * {50/5} = 0.0053 mg/l**	✓

Formulas:

* Conc. (mg/kg) = {(Raw Conc. in ug/L) x (Vol. in L) x DF} / {(Sample mass in kg) x (fractional solids) x (1000)}

** Serial dilution conc. (ug/L) = (Raw Conc. in ug/L) x (DF, typically 5)

*** %R = [(Measured Value) / (True Value)] x 100

**** %R = {(Spike sample result) - (Sample result)} / (Spike added)} x 100

RPD = [(A-B) / {(A + B)/2}] x 100

Percent difference = [(Original Result - Diluted Result) / Original Result] x 100

6020A

nickel 06212021 mass uncorrected CPS:ppb

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
0.0	219	1.0	491759	0.00
10.0	10964	1.0	511011	0.02
100.0	105423	1.0	500898	0.21
500.0	520525	1.0	522797	1.00
			RSE in X:	

Relative Errors in X

Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
299.94%	0.00%	-8.01%	2231370.33%	##########	550814.92%
-99.98%	1.80%	4.52%	7.51%	-12.80%	-0.63%
-99.98%	1.76%	4.48%	5.46%	3.89%	0.01%
-99.98%	-3.56%	-0.99%	-0.22%	-0.15%	0.00%
200.0%	3.1%	7.3%	1288282.3%	13145577.7%	550814.9%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r²	r
Weighted (1/Amt^2)						
Average		1.1135E+01		0	#########	#NUM!
Linear	4.4532E-04	2.0639E-03		-0.22	0.99793	0.99896
Weighted (1/Amt)						
Linear	4.4532E-04	2.0102E-03		-0.22	0.99973	0.99986
Unweighted						
Forced Zero		1.9957E-03		0	0.99988	0.99994
Linear	4.1375E-03	1.9860E-03		-2.08	0.99988	0.99994
Quadratic	3.2806E-04	2.1289E-03	-2.7646E-07	-0.15	1.00000	1.00000
	c	b	a			

Sample Results

	ICV	LLCV	LCS	MB	Sample 1
Instrum.Responses:	216795		558996		11452
IS Response:	546718		569530		508716
Avg RF Result:	0.036	#DIV/0!	0.088	#DIV/0!	0.002
Linear(1/x2) Result:	191.914	#DIV/0!	475.339	#DIV/0!	10.692
Linear(1/x) Result:	197.039	#DIV/0!	488.033	#DIV/0!	10.977
Linear Forced:	198.694	#DIV/0!	491.803	#DIV/0!	11.280
Linear Result:	197.582	#DIV/0!	492.123	#DIV/0!	9.252
Quad Result (no IS):					
Quad Result (with IS):	190.842	#DIV/0!	492.370	#DIV/0!	10.435

Y = bX X = Y/b

Y = bX + c X = (Y-c)/b

Quadratic Sample Calcs

$y = ax^2 + bx + c$

$x = (-b \pm \sqrt{b^2-4a(c-y)})/2*a$

Intercept Calcul

2a =	-5.5292E-07
c-y =	3.2806E-04
4a(c-y) =	-3.6278E-10
b*b =	4.5321E-06

Quad Without IS:

2a =	-5.5292E-07	-5.5292E-07	-5.5292E-07	-5.5292E-07	-5.5292E-07
c-y =	-2.1679E+05	3.2806E-04	-5.5900E+05	3.2806E-04	-1.1452E+04
4a(c-y) =	2.3974E-01	-3.6278E-10	6.1816E-01	-3.6278E-10	1.2665E-02
b*b =	4.5321E-06	4.5321E-06	4.5321E-06	4.5321E-06	4.5321E-06

Quad With IS:

2a =	-5.5292E-07	-5.5292E-07	-5.5292E-07	-5.5292E-07	-5.5292E-07
$y = A_{(s)}*Conc_{(is)} / A_{(is)} =$	0.396538984	#DIV/0!	0.981504047	#DIV/0!	0.022512364
c-y =	-3.9621E-01	#DIV/0!	-9.8118E-01	#DIV/0!	-2.2184E-02
4a(c-y) =	4.3815E-07	#DIV/0!	1.0850E-06	#DIV/0!	2.4532E-08
b*b =	4.5321E-06	4.5321E-06	4.5321E-06	4.5321E-06	4.5321E-06

6020A
silver 06212021 CPS:ppb

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
0.0	53	1.0	181017	0.00
1.0	20374	1.0	180001	0.11
10.0	205506	1.0	175078	1.17
100.0	2030576	1.0	167553	12.12
RSE in X:				

Relative Errors in X

Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
295.28%	0.00%	9.00%	24217.83%	1255648.71%	171605.50%
-98.48%	-3.63%	-6.52%	-6.57%	5.61%	-1.92%
-98.43%	0.18%	-2.83%	-3.11%	-2.01%	0.02%
-98.37%	3.45%	0.35%	0.03%	0.02%	0.00%
196.9%	3.5%	8.1%	13982.2%	887877.7%	171605.5%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r²	r
Weighted (1/Amt^2)						
Average		7.4533E+00		0	#########	#NUM!
Linear	2.9344E-04	1.1714E-01		0.00	0.99842	0.99921
Weighted (1/Amt)						
Linear	2.9330E-04	1.2077E-01		0.00	0.99997	0.99999
Unweighted						
Forced Zero		1.2115E-01		0	0.99999	0.99999
Linear	-1.4940E-02	1.2132E-01		0.12	0.99999	1.00000
Quadratic	-1.7164E-03	1.1712E-01	4.0893E-05	0.01	1.00000	1.00000
	c	b	a			

Sample Results

	ICV	LLCV	LCS	MB	Sample 1
Instrum.Responses:	827547	10370	1000453	110	980
IS Response:	171073.1	173124.3	168972.6	172953.1	167048.5
Avg RF Result:	0.649	0.008	0.794	0.000	0.001
Linear(1/x2) Result:	41.292	0.509	50.541	0.003	0.048
Linear(1/x) Result:	40.053	0.494	49.024	0.003	0.046
Linear Forced:	39.928	0.494	48.871	0.005	0.048
Linear Result:	39.998	0.617	48.928	0.128	0.172
Quad Result (no IS):					
Quad Result (with IS):	40.739	0.526	49.706	0.020	0.065

Y = bX X = Y/b
Y = bX + c X = (Y-c)/b

Quadratic Sample Calcs

$y = ax^2 + bx + c$

$x = (-b \pm \sqrt{b^2-4a(c-y)})/2*a$

Intercept Calcul

2a =	8.1786E-05
c-y =	-1.7164E-03
4a(c-y) =	-2.8075E-07
b*b =	1.3717E-02

Quad Without IS:

2a =	8.1786E-05	8.1786E-05	8.1786E-05	8.1786E-05	8.1786E-05
c-y =	-8.2755E+05	-1.0370E+04	-1.0005E+06	-1.1000E+02	-9.8010E+02
4a(c-y) =	-1.3536E+02	-1.6963E+00	-1.6365E+02	-1.7993E-02	-1.6032E-01
b*b =	1.3717E-02	1.3717E-02	1.3717E-02	1.3717E-02	1.3717E-02

Quad With IS:

2a =	8.1786E-05	8.1786E-05	8.1786E-05	8.1786E-05	8.1786E-05
$y = A_{(s)}*Conc_{(is)} / A_{(is)} =$	4.837388228	0.05990147	5.92079781	0.000636011	0.005867158
c-y =	-4.8391E+00	-6.1618E-02	-5.9225E+00	-2.3524E-03	-7.5835E-03
4a(c-y) =	-7.9154E-04	-1.0079E-05	-9.6876E-04	-3.8479E-07	-1.2405E-06
b*b =	1.3717E-02	1.3717E-02	1.3717E-02	1.3717E-02	1.3717E-02

7470A
mercury 06212021 abs:ppb

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Response
0.0	588			588.00
0.2	2148			2148.00
0.5	4945			4945.00
1.0	8690			8690.00
3.0	25814			25814.00
5.0	42220			42220.00
10.0	83249			83249.00

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	599.35%	0.00%	2.30%	702255.88%	-87758.05%	57823.88%
	-99.87%	-5.67%	-6.04%	28.29%	-10.13%	-4.48%
	-99.88%	5.38%	4.97%	18.13%	3.54%	4.70%
	-99.90%	-2.03%	-2.40%	3.80%	-2.97%	-3.08%
	-99.90%	1.68%	1.29%	2.78%	1.32%	0.56%
	-99.90%	0.69%	0.30%	0.86%	0.44%	-0.14%
	-99.90%	-0.04%	-0.43%	-0.56%	-0.20%	0.00%
RSE in X:	264.3%	3.7%	3.9%	286694.8%	39246.6%	28911.9%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r²	r
Weighted (1/Amt^2)						
Average		8.4078E+06		0	#########	#NUM!
Linear	5.8792E+02	8.2696E+03		-0.07	0.99994	0.99997
Weighted (1/Amt)						
Linear	5.8792E+02	8.3014E+03		-0.07	0.99994	0.99997
Unweighted						
Forced Zero		8.3718E+03		0	0.99978	0.99989
Linear	6.6054E+02	8.2756E+03		-0.08	0.99995	0.99997
Quadratic	5.3920E+02	8.4243E+03	-1.5367E+01	-0.06	0.99998	0.99999
	c	b	a			

Sample Results

Instrum.Responses:	ICV	LLCV	LCS	MB	Sample 1
	17672	2425	17167	377	505
IS Response:					
Avg RF Result:	0.002	0.000	0.002	0.000	0.000
Linear(1/x2) Result:	2.066	0.222	2.005	-0.026	-0.010
Linear(1/x) Result:	2.058	0.221	1.997	-0.025	-0.010
Linear Forced:	2.111	0.290	2.051	0.045	0.060
Linear Result:	2.056	0.213	1.995	-0.034	-0.019
Quad Result (no IS):	2.041	0.224	1.981	-0.019	-0.004
Quad Result (with IS):					

Y = bX X = Y/b
Y = bX + c X = (Y-c)/b

Quadratic Sample Calcs

$y = ax^2 + bx + c$

$x = (-b \pm \sqrt{b^2-4a(c-y)})/2*a$

Intercept Calcul

2a =	-3.0735E+01
c-y =	5.3920E+02
4a(c-y) =	-3.3144E+04
b*b =	7.0969E+07

Quad Without IS:

2a =	-3.0735E+01	-3.0735E+01	-3.0735E+01	-3.0735E+01	-3.0735E+01
c-y =	-1.7133E+04	-1.8858E+03	-1.6628E+04	1.6220E+02	3.4204E+01
4a(c-y) =	1.0531E+06	1.1592E+05	1.0221E+06	-9.9705E+03	-2.1025E+03
b*b =	7.0969E+07	7.0969E+07	7.0969E+07	7.0969E+07	7.0969E+07

Quad With IS:

2a =	-3.0735E+01	-3.0735E+01	-3.0735E+01	-3.0735E+01	-3.0735E+01
$y = A_{(s)}*Conc_{(is)} / A_{(is)} =$	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
c-y =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4a(c-y) =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b*b =	7.0969E+07	7.0969E+07	7.0969E+07	7.0969E+07	7.0969E+07

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201159-1 Method 7470_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Initial Calibration	Confirm (in ICP raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).			
	Confirm (in ICP raw data) that an initial calibration occurs at the required frequency.			
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**06212021 10:16**	**blank plus six non-zero standards. See 500-201159-1 Hg ICAL worksheet**	✓
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**				
ICV	Check result mercury	**06212021 10:41**	**rpt: 2.06 ug/L raw: 2.056**	✓
	Recalculate one %R	**rpt: 103%**	**Calculated result:*** 2.056/2 = 103%**	✓
ICB	Check result	**06212021 10:43**	**rpt: <0.2 raw: -0.051**	✓
CRDL Check Standard	Check result	**06212021 10:45**	**rpt: 0.213 ug/L raw: 0.213**	✓
	Recalculate one %R	**rpt:107%**	**Calculated result:***0.213/0.2 = 106.5%**	✓
An opening CCV applicable to our samples	Check result	**06212021 12:48**	**rpt: 1.02 ug/L raw: 1.021**	✓
	Recalculate one %R	**rpt:102%**	**Calculated result:*** 1.021/1 = 102%**	✓
A closing CCV applicable to our samples	Check result	**06212021 01:11**	**rpt: 1.07 ug/L raw: 1.07**	✓
	Recalculate one %R	**rpt: 107%**	**Calculated result:*** 1.07/1= 107%**	✓
An opening CCB applicable to our samples	Check result	**06212021 12:51**	**rpt: <0.2 raw: -0.035**	✓
A closing CCB applicable to our samples	Check result	**06212021 01:13**	**rpt: <0.2 raw: -0.029**	✓

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201159-1 Method 7470_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Method blank	Check result	**06212021 11:10**	**rpt: <0.2 raw: -0.034**	✓
	recalculate result		**Calculated result:* NA**	
ICSA sample	Check result	**NA**		
	Recalculate one %R	**NA**	**Calculated result:*****	
ICSAB sample	Check result	**NA**		
	Recalculate one %R	**NA**	**Calculated result:*****	
MS	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:******	
MSD	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:******	
	Recalculate one RPD value between MS and MSD		**Calculated result:**	
Post-digestion spike	Check result	**NA**		
	Recalculate one %R		**Calculated result:******	
LCS	Check result	**06212021 11:38**	**rpt: 2.0 raw: 1.995**	✓
	Recalculate one %R	**rpt: 100%**	**Calculated result:***41.995/2.0 = 100%**	✓
Serial Dilution	Check result	**NA**	**Calculated result:****	
	Recalculate one percent difference value		**Calculated result:**	
Sample result	Check result	**RCF-TR-210618 05212021 12:53**	**rpt: 0.49U raw:-0.019**	✓
MDL	rpt: 0.00049 mg/l	**RCF-TR-210618**	**Calculated result:(0.0984)(5)/1000 =0.000492 mg/l**	✓
RL for	rpt: 0.0010 mg/l	**RCF-TR-210618**	**Calculated result:(0.20)(5)/1000 = .0010 mg/l**	✓

* Conc. (mg/kg) = {(Raw Conc. in ug/L) x (Vol. in L) x DF} / {(Sample mass in kg) x (fractional solids) x (1000)}
** Serial dilution conc. (ug/L) = (Raw Conc. in ug/L) x (DF, typically 5)
*** %R = [(Measured Value) / (True Value)] x 100
**** %R = {(Spike sample result) - (Sample result)} / (Spike added)} x 100
RPD = A-B]/{(A + B)/2} x 100
Percent difference = [(Original Result - Diluted Result) / Original Result] x 100

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201159-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
Initial Calibration	Confirm (in raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).	**Instrument CMS20 2/13/2021 8-point calibration**	**See calibration spreadsheet**
	Confirm (in raw data) that an initial calibration occurs at the required frequency.	**Yes**	
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**reported 0.5838 chloroform**	**Calculated RRF: 50 ppb std 6266*50/536651=0.58380**
			Calculated $\overline{RRF}$: See calibration spreadsheet
			Calculated %RSD: See calibration spreadsheet

Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation.

SHOW ALL WORK FOR RECALCULATIONS

Tune	Confirm BFB Percent Relative Abundance	**06/21/2021 07:59 mass 50 reported 19.0% %**	**2097/11047*100=18.98%%**

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

DData Package Number: 201159-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
ICV	Check result	**CMS29 2/13/2021 02:42**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %R		
A CCV applicable to our samples	Check result	**CMS29 6/21/2021 08:18**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %D		
Method Blank	Check result	**605160 benzene reported 0.219 ug/L**	**2535*50/556709*1.0383=0.2193**
Surrogate	Recalculate one %R	**6/21/10:58 RCF-TR-1 toluene-d8 reported 99%**	**49.5/50*100=99.00**
MS	Check result	**N/A**	
	Recalculate one %R		
MSD	Check result	**N/A**	
	Recalculate one %R		
	Recalculate one RPD value between MS and MSD		

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201159-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
LCS	Check result	**605165 6/21/2021 14:44**	**See calibration spreadsheet.**
	Recalculate one %R	**2-butanone reported 101%**	**50.6/50*100=101.2%**
LCSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between LCS and LCSD	**N/A**	
Internal Standards	Recalculate one %R	**fluorobenze RCF-TR-1**	**545603/597624*100=91.3%**
	Recalculate one delta RT	**fluorobenze RCF-TR-1**	**6.92-6.92=0.00 min.**
Sample Result for cis-1,2-DCE	Check result		**See calibration spreadsheet**
MDL for __RCF-TR-1__cis-1,2-DCE	Check result	**reported 0.41 ug/L**	**nominal MDL 0.41 ug/L**
RL for __RCF-TR-1__cis-1,2-DCE	Check result	**reported 1/0 ug/L**	**nominal MDL 1.0 ug/L**
Convert µg/m^3 to ppbV (air only) for _____	Check result	**N/A**	

ICAL CMS29 2/13/2021
cis-1,2-dichloroethene

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
1.0	3793	50.0	536651	0.35
2.0	6912	50.0	516380	0.67
5.0	16877	50.0	534690	1.58
20.0	68967	50.0	531044	6.49
50.0	152908	50.0	528267	14.47
100.0	338997	50.0	541277	31.31
150.0	521882	50.0	570255	45.76
200.0	723291	50.0	575899	62.80

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	10.87%	-0.48%	0.14%	13.83%	49.65%	-22.99%
	4.98%	0.99%	1.20%	7.79%	25.57%	-8.10%
	-0.97%	-0.65%	-0.66%	1.67%	8.63%	-1.85%
	1.86%	4.55%	4.40%	4.58%	6.12%	7.07%
	-9.19%	-6.42%	-6.57%	-6.77%	-6.28%	-4.23%
	-1.76%	1.41%	1.24%	0.87%	0.97%	2.52%
	-4.30%	-1.16%	-1.33%	-1.74%	-1.75%	-1.25%
	-1.49%	1.76%	1.58%	1.14%	1.06%	0.27%
RSE in X:	6.0%	3.4%	3.4%	6.8%	23.4%	11.6%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r^2	r
Weighted (1/Amt^2)						
Average		3.1875E-01		0	0.99895	0.99948
Linear	4.6545E-02	3.0832E-01		-0.15	0.99931	0.99965
Weighted (1/Amt)						
Linear	4.4103E-02	3.0887E-01		-0.14	0.99934	0.99967
Unweighted						
Forced Zero		3.1046E-01		0	0.99967	0.99983
Linear	-1.1239E-01	3.1124E-01		0.36	0.99940	0.99970
Quadratic	1.2573E-01	2.9556E-01	8.4522E-05	-0.43	0.99959	0.99979
	c	b	a			

Sample Results

	ICV	CCV	LCS	RCF-TR-1	Sample 5
Instrum.Responses:	161830	193191	193191	12570	
IS Response:	545767	597624	607862	545603	
Avg RF Result:	46.513	50.708	49.854	3.614	#DIV/0!
Linear(1/x2) Result:	47.934	52.272	51.389	3.585	#DIV/0!
Linear(1/x) Result:	47.858	52.187	51.306	3.587	#DIV/0!
Linear Forced:	47.755	52.063	51.186	3.710	#DIV/0!
Linear Result:	47.996	52.292	51.418	4.062	#DIV/0!
Quad Result (no IS):					
Quad Result (with IS):	49.049	53.445	52.551	3.469	#DIV/0!

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201159-1_8270D

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
Initial Calibration	Confirm (in raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).	**Instrument CMS01 6/11/2021 11:33 – 15:29 multi-point calibration**	**See calibration spreadsheet**
	Confirm (in raw data) that an initial calibration occurs at the required frequency.	**Yes**	
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**reported 0.8778 naphthalene**	**Calculated RRF: 8 ppb std 4087799*3.2/1862839*8=0.87775**
			Calculated RRF: See calibration spreadsheet
			Calculated %RSD: See calibration spreadsheet
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**			
Tune	Confirm BFB Percent Relative Abundance	**06/21/2021 09:19 mass 275 reported 21.2%**	**166016/781952*100=21.23%%**

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

DData Package Number: 201159-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
ICV	Check result	**CMS01 6/11/2021 15:53**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %R		
A CCV applicable to our samples	Check result	**CMS01 6/21/2021 10:34**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %D		
Method Blank	Check result	**All ND**	**All ND**
Surrogate	Recalculate one %R	**6/21/2021 RCF-TR-1 0%**	**Diluted out**
MS	Check result	**N/A**	
	Recalculate one %R		
MSD	Check result	**N/A**	
	Recalculate one %R		
	Recalculate one RPD value between MS and MSD		

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201159-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
LCS	Check result	**605165/2 6/21/2021 14:44**	**See calibration spreadsheet.**
	Recalculate one %R	**naphthalene reported 64%**	**20.5/32*100=64.06%**
LCSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between LCS and LCSD	**N/A**	
Internal Standards	Recalculate one %R	**DCBd4 RCF-TR-1**	**242139/350587*100=69.0667%**
	Recalculate one delta RT	**DCBd4 RCF-TR-1**	**4.87-4.87=0.00 min.**
Sample Result for naphthalene	Check result		**See calibration spreadsheet**
MDL for __RCF-TR-1_naphthalene	Check result	**reported 1200 ug/L**	**nominal MDL 0.25 ug/L Blank 250 mL to 1.0 mL Sample 5.0 ml to 5.0 mL 20 DF = 1250 ug/L**
RL for __RCF-TR-1_naphthalene	Check result	**reported 4000 ug/L**	**nominal MDL 0.80 ug/L 0.80 ug/L Blank 250 mL to 1.0 mL Sample 5.0 ml to 5.0 mL 20 DF =4000ug/L**
Convert µg/m^3 to ppbV (air only) for	Check result	**N/A**	

ICAL CMS01 6/11/2021
naphthalene

Input Calibration Data / **Relative Errors in X**

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
0.2	106449	3.2	1739524	0.20	7.39%	-3.13%	-24.22%	18.28%	-161.20%	11.21%
0.4	225071	3.2	1874830	0.38	5.34%	1.58%	-5.93%	16.02%	-71.67%	1.18%
1.0	563562	3.2	1857182	0.97	6.50%	6.88%	7.65%	17.31%	-15.21%	-1.94%
2.0	1108113	3.2	1814067	1.95	7.20%	8.96%	12.51%	18.07%	3.96%	-1.30%
4.0	2253485	3.2	1858017	3.88	6.42%	8.85%	13.71%	17.22%	12.26%	0.94%
8.0	4087799	3.2	1862839	7.02	-3.73%	-1.25%	3.70%	6.04%	5.27%	-1.93%
10.0	4953169	3.2	1815705	8.73	-4.26%	-1.73%	3.33%	5.46%	5.59%	2.52%
12.0	5562331	3.2	1823325	9.76	-10.77%	-8.39%	-3.62%	-1.72%	-1.24%	-1.02%
14.0	6249622	3.2	1823625	10.97	-14.09%	-11.77%	-7.13%	-5.37%	-4.58%	0.05%
				RSE in X:	8.4%	7.9%	12.6%	14.2%	67.2%	4.9%

Curve Fit Statistics / **Sample Results**

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r^2	r		ICV	CCV	LCS	RCF-TR-1	Sample 5
							Instrum.Responses:	4470517	2464587	1274668	15804	
Weighted (1/Amt^2)							IS Response:	1701617	1244111	871484	927521	
Average		9.1174E-01		0	0.98637	0.99316	Avg RF Result:	9.221	6.953	5.134	0.060	#DIV/0!
Linear	2.4205E-02	8.8585E-01		-0.03	0.97905	0.98947	Linear(1/x2) Result:	9.463	7.129	5.256	0.034	#DIV/0!
Weighted (1/Amt)												
Linear	6.8795E-02	8.3814E-01		-0.08	0.99163	0.99581	Linear(1/x) Result:	9.949	7.481	5.502	-0.017	#DIV/0!
Unweighted												
Forced Zero		8.2777E-01		0	0.99662	0.99831	Linear Forced:	10.156	7.658	5.654	0.066	#DIV/0!
Linear	2.9361E-01	7.9892E-01		-0.37	0.99402	0.99701	Linear Result:	10.156	7.567	5.491	-0.299	#DIV/0!
Quadratic	-3.5648E-02	1.0448E+00	-1.8514E-02	0.03	0.99966	0.99983	Quad Result (no IS):					
	c	b	a				Quad Result (with IS):	9.773	6.960	4.948	0.086	#DIV/0!

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-1

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	6020A	Aluminum	28		0.25	1.0	mg/L	28	
RCF-TR-1-210618	6020A	Antimony	1.3		0.013	0.030	mg/L	1.3	
RCF-TR-1-210618	6020A	Arsenic	0.042		0.0023	0.010	mg/L	0.042	
RCF-TR-1-210618	6020A	Barium	2.3		0.0073	0.025	mg/L	2.3	
RCF-TR-1-210618	6020A	Beryllium	0.0053	U	0.0053	0.010	mg/L	0.010	U
RCF-TR-1-210618	6020A	Cadmium	0.015		0.0017	0.0050	mg/L	0.015	
RCF-TR-1-210618	6020A	Calcium	4800		2.2	10	mg/L	4800	
RCF-TR-1-210618	6020A	Chromium	0.089		0.011	0.050	mg/L	0.089	
RCF-TR-1-210618	6020A	Cobalt	0.084		0.0040	0.010	mg/L	0.084	
RCF-TR-1-210618	6020A	Copper	0.54		0.0050	0.020	mg/L	0.54	
RCF-TR-1-210618	6020A	Iron	21		0.47	1.0	mg/L	21	
RCF-TR-1-210618	6020A	Lead	0.20		0.0019	0.0050	mg/L	0.20	
RCF-TR-1-210618	6020A	Lithium	14		0.0050	0.020	mg/L	14	
RCF-TR-1-210618	6020A	Magnesium	97		0.49	2.0	mg/L	97	
RCF-TR-1-210618	6020A	Manganese	2.5		0.0079	0.025	mg/L	2.5	
RCF-TR-1-210618	6020A	Nickel	0.11		0.0063	0.020	mg/L	0.11	
RCF-TR-1-210618	6020A	Potassium	46		1.1	5.0	mg/L	46	
RCF-TR-1-210618	6020A	Selenium	0.0098	U	0.0098	0.025	mg/L	0.025	U
RCF-TR-1-210618	6020A	Silver	0.0012	U	0.0012	0.0050	mg/L	0.0050	U
RCF-TR-1-210618	6020A	Sodium	88		0.77	2.0	mg/L	88	
RCF-TR-1-210618	6020A	Thallium	0.0057	U	0.0057	0.020	mg/L	0.020	U
RCF-TR-1-210618	6020A	Vanadium	0.057		0.022	0.050	mg/L	0.057	
RCF-TR-1-210618	6020A	Zinc	86		0.35	1.0	mg/L	86	
RCF-TR-1-210618	7470A	Mercury	0.00049	U	0.00049	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,1,1-Trichloroethane	0.00038	U	0.00038	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,1,2,2-Tetrachloroethane	0.00040	U	0.00040	0.0010	mg/L	0.0010	UJ
RCF-TR-1-210618	8260B	1,1,2-Trichloro-1,2,2-trifluoroethane	0.00046	U	0.00046	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,1,2-Trichloroethane	0.00035	U	0.00035	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,1-Dichloroethane	0.00041	U	0.00041	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,1-Dichloroethene	0.00039	U	0.00039	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,2,4-Trichlorobenzene	0.00034	U	0.00034	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,2-Dibromo-3-Chloropropane	0.0020	U	0.0020	0.0050	mg/L	0.0050	U
RCF-TR-1-210618	8260B	1,2-Dibromoethane	0.00039	U	0.00039	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,2-Dichlorobenzene	0.00033	U	0.00033	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,2-Dichloroethane	0.00039	U	0.00039	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,2-Dichloropropane	0.00043	U	0.00043	0.0010	mg/L	0.0010	U

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-1

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	8260B	1,3-Dichlorobenzene	0.00040	U	0.00040	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1,4-Dichlorobenzene	0.00036	U	0.00036	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	1-Hexanol, 2-ethyl-	0.031	T J N			mg/L	0.031	NJ
RCF-TR-1-210618	8260B	1-Octanol	0.0096	T J N			mg/L	0.0096	NJ
RCF-TR-1-210618	8260B	2-Hexanone	0.0034	J	0.0016	0.0050	mg/L	0.0034	J
RCF-TR-1-210618	8260B	2-Methyl-2-propanol	47	J	12	50	ug/L	47	J
RCF-TR-1-210618	8260B	Acetaldehyde	0.30	T J N			mg/L	0.30	NJ
RCF-TR-1-210618	8260B	Acetone	0.15		0.0017	0.010	mg/L	0.15	
RCF-TR-1-210618	8260B	Benzene	0.0014	B	0.00015	0.00050	mg/L	0.0014	J+
RCF-TR-1-210618	8260B	Bromodichloromethane	0.00037	U	0.00037	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Bromoform	0.00048	U	0.00048	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Bromomethane	0.00080	U	0.00080	0.0030	mg/L	0.0030	U
RCF-TR-1-210618	8260B	Butanal	0.019	T J N			mg/L	0.019	NJ
RCF-TR-1-210618	8260B	Carbon disulfide	0.00045	U	0.00045	0.0020	mg/L	0.0020	U
RCF-TR-1-210618	8260B	Carbon tetrachloride	0.00038	U	0.00038	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Chlorobenzene	0.00039	U	0.00039	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Chloroethane	0.00051	U	0.00051	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Chloroform	0.00037	U	0.00037	0.0020	mg/L	0.0020	U
RCF-TR-1-210618	8260B	Chloromethane	0.00032	U	0.00032	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	cis-1,2-Dichloroethene	0.0036		0.00041	0.0010	mg/L	0.0036	
RCF-TR-1-210618	8260B	cis-1,3-Dichloropropene	0.00042	U	0.00042	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Cyclohexane	0.00049	U	0.00049	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Dibromochloromethane	0.00049	U	0.00049	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Dichlorodifluoromethane	0.00067	U	0.00067	0.0030	mg/L	0.0030	UJ
RCF-TR-1-210618	8260B	Ethanol	98000	E	53	200	ug/L	98000	J
RCF-TR-1-210618	8260B	Ethylbenzene	0.00018	U	0.00018	0.00050	mg/L	0.00050	U
RCF-TR-1-210618	8260B	Isopropylbenzene	0.00039	U	0.00039	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Methyl acetate	0.0049	J	0.0020	0.0050	mg/L	0.0049	J
RCF-TR-1-210618	8260B	Methyl Ethyl Ketone	0.026		0.0021	0.0050	mg/L	0.026	
RCF-TR-1-210618	8260B	methyl isobutyl ketone	0.0036	J	0.0022	0.0050	mg/L	0.0036	J
RCF-TR-1-210618	8260B	Methyl tert-butyl ether	0.00039	U	0.00039	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Methylcyclohexane	0.00032	U	0.00032	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Methylene Chloride	0.0016	U	0.0016	0.0050	mg/L	0.0050	U
RCF-TR-1-210618	8260B	Naphthalene	2.1		0.34	1.0	ug/L	1.2	J
RCF-TR-1-210618	8260B	n-Butanol	22000	E	53	130	ug/L	22000	J
RCF-TR-1-210618	8260B	Styrene	0.00039	U	0.00039	0.0010	mg/L	0.0010	U

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-1

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	8260B	Tetrachloroethene	0.00064	J	0.00037	0.0010	mg/L	0.00064	J
RCF-TR-1-210618	8260B	Toluene	0.00042	J	0.00015	0.00050	mg/L	0.00042	J
RCF-TR-1-210618	8260B	trans-1,2-Dichloroethene	0.00035	U	0.00035	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	trans-1,3-Dichloropropene	0.00036	U	0.00036	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Trichloroethene	0.00016	U	0.00016	0.00050	mg/L	0.00050	U
RCF-TR-1-210618	8260B	Trichlorofluoromethane	0.00043	U	0.00043	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Unknown	0.013	T J			mg/L	65	J
RCF-TR-1-210618	8260B	Unknown	0.0073	T J			mg/L	65	J
RCF-TR-1-210618	8260B	Vinyl chloride	0.00020	U	0.00020	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8260B	Xylenes, Total	0.00022	U	0.00022	0.0010	mg/L	0.0010	U
RCF-TR-1-210618	8270D	1,1'-Biphenyl	1.5	U	1.5	20	mg/L	20	U
RCF-TR-1-210618	8270D	1-Decene	28	T J N			mg/L	28	NJ
RCF-TR-1-210618	8270D	2,2'-oxybis[1-chloropropane]	1.5	U	1.5	8.0	mg/L	8.0	U
RCF-TR-1-210618	8270D	2,4,5-Trichlorophenol	10	U	10	40	mg/L	40	U
RCF-TR-1-210618	8270D	2,4,6-Trichlorophenol	2.9	U	2.9	20	mg/L	20	U
RCF-TR-1-210618	8270D	2,4-Dichlorophenol	10	U	10	40	mg/L	40	U
RCF-TR-1-210618	8270D	2,4-Dimethylphenol	7.2	U	7.2	40	mg/L	40	U
RCF-TR-1-210618	8270D	2,4-Dinitrophenol	34	U	34	80	mg/L	80	U
RCF-TR-1-210618	8270D	2,4-Dinitrotoluene	0.98	U	0.98	4.0	mg/L	4.0	U
RCF-TR-1-210618	8270D	2,6-Dinitrotoluene	0.30	U	0.30	4.0	mg/L	4.0	U
RCF-TR-1-210618	8270D	2-Chloronaphthalene	0.94	U	0.94	8.0	mg/L	8.0	U
RCF-TR-1-210618	8270D	2-Chlorophenol	2.2	U	2.2	20	mg/L	20	U
RCF-TR-1-210618	8270D	2-Methylnaphthalene	0.99	J	0.26	8.0	mg/L	0.99	J
RCF-TR-1-210618	8270D	2-Methylphenol	1.2	U	1.2	8.0	mg/L	8.0	U
RCF-TR-1-210618	8270D	2-Nitroaniline	5.2	U	5.2	20	mg/L	20	U
RCF-TR-1-210618	8270D	2-Nitrophenol	10	U	10	40	mg/L	40	U
RCF-TR-1-210618	8270D	3 & 4 Methylphenol	1.8	U	1.8	8.0	mg/L	8.0	U
RCF-TR-1-210618	8270D	3,3'-Dichlorobenzidine	6.9	U	6.9	20	mg/L	20	U
RCF-TR-1-210618	8270D	3-Nitroaniline	7.2	U	7.2	40	mg/L	40	U
RCF-TR-1-210618	8270D	4,6-Dinitro-2-methylphenol	24	U	24	80	mg/L	80	U
RCF-TR-1-210618	8270D	4-Bromophenyl phenyl ether	2.2	U	2.2	20	mg/L	20	U
RCF-TR-1-210618	8270D	4-Chloro-3-methylphenol	9.2	U	9.2	40	mg/L	40	U
RCF-TR-1-210618	8270D	4-Chloroaniline	8.1	U	8.1	40	mg/L	40	U
RCF-TR-1-210618	8270D	4-Chlorophenyl phenyl ether	2.5	U	2.5	20	mg/L	20	U
RCF-TR-1-210618	8270D	4-Nitroaniline	6.7	U	6.7	40	mg/L	40	U
RCF-TR-1-210618	8270D	4-Nitrophenol	30	U	30	80	mg/L	80	UJ

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-1

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	8270D	Acenaphthene	1.2	U	1.2	4.0	mg/L	4.0	U
RCF-TR-1-210618	8270D	Acenaphthylene	1.9	J	1.1	4.0	mg/L	1.9	J
RCF-TR-1-210618	8270D	Acetamide, N-methyl-N-[4-[4-methoxy-1-hexahydropyridyl]-2-bu	30	T J			mg/L	30	NJ
RCF-TR-1-210618	8270D	Acetamide, N-methyl-N-[4-[4-methoxy-1-hexahydropyridyl]-2-bu	19	T J			mg/L	19	NJ
RCF-TR-1-210618	8270D	Acetophenone	2.7	U	2.7	20	mg/L	20	U
RCF-TR-1-210618	8270D	Anthracene	1.3	U	1.3	4.0	mg/L	4.0	U
RCF-TR-1-210618	8270D	Atrazine	2.5	U	2.5	20	mg/L	20	U
RCF-TR-1-210618	8270D	Benzaldehyde	61	U	61	160	mg/L	160	UJ
RCF-TR-1-210618	8270D	Benzo[a]anthracene	0.23	U	0.23	0.80	mg/L	0.80	U
RCF-TR-1-210618	8270D	Benzo[a]pyrene	0.40	U	0.40	0.80	mg/L	0.80	U
RCF-TR-1-210618	8270D	Benzo[b]fluoranthene	0.32	U	0.32	0.80	mg/L	0.80	U
RCF-TR-1-210618	8270D	Benzo[g,h,i]perylene	1.5	U	1.5	4.0	mg/L	4.0	U
RCF-TR-1-210618	8270D	Benzo[k]fluoranthene	0.26	U	0.26	0.80	mg/L	0.80	U
RCF-TR-1-210618	8270D	Bis(2-chloroethoxy)methane	1.1	U	1.1	8.0	mg/L	8.0	R
RCF-TR-1-210618	8270D	Bis(2-chloroethyl)ether	1.2	U	1.2	8.0	mg/L	8.0	R
RCF-TR-1-210618	8270D	Bis(2-ethylhexyl) phthalate	6.9	U	6.9	40	mg/L	40	UJ
RCF-TR-1-210618	8270D	Butyl benzyl phthalate	1.9	U	1.9	8.0	mg/L	8.0	UJ
RCF-TR-1-210618	8270D	Caprolactam	6.0	U	6.0	40	mg/L	40	U
RCF-TR-1-210618	8270D	Carbazole	1.4	U	1.4	20	mg/L	20	U
RCF-TR-1-210618	8270D	Chrysene	0.27	U	0.27	0.80	mg/L	0.80	U
RCF-TR-1-210618	8270D	Dibenz(a,h)anthracene	0.20	U	0.20	1.2	mg/L	1.2	U
RCF-TR-1-210618	8270D	Dibenzofuran	1.1	U	1.1	8.0	mg/L	8.0	U
RCF-TR-1-210618	8270D	Diethyl phthalate	1.4	U	1.4	20	mg/L	20	U
RCF-TR-1-210618	8270D	Dimethyl phthalate	1.3	U	1.3	20	mg/L	20	U
RCF-TR-1-210618	8270D	Di-n-butyl phthalate	2.9	U	2.9	20	mg/L	20	U
RCF-TR-1-210618	8270D	Di-n-octyl phthalate	4.2	U	4.2	40	mg/L	40	U
RCF-TR-1-210618	8270D	Fluoranthene	1.8	U	1.8	4.0	mg/L	4.0	U
RCF-TR-1-210618	8270D	Fluorene	0.98	U	0.98	4.0	mg/L	4.0	U
RCF-TR-1-210618	8270D	Heptadecane	25	T J N			mg/L	25	NJ
RCF-TR-1-210618	8270D	Hexachlorobenzene	0.32	U	0.32	2.0	mg/L	2.0	U
RCF-TR-1-210618	8270D	Hexachlorobutadiene	2.1	U	2.1	20	mg/L	20	U
RCF-TR-1-210618	8270D	Hexachlorocyclopentadiene	26	U	26	80	mg/L	80	U
RCF-TR-1-210618	8270D	Hexachloroethane	2.4	U	2.4	20	mg/L	20	U
RCF-TR-1-210618	8270D	Indeno[1,2,3-cd]pyrene	0.30	U	0.30	0.80	mg/L	0.80	U
RCF-TR-1-210618	8270D	Isophorone	1.5	U	1.5	8.0	mg/L	8.0	R
RCF-TR-1-210618	8270D	Naphthalene	1.2	J	1.2	4.0	mg/L	1.2	J

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-1

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	8270D	Nitrobenzene	1.8	U	1.8	4.0	mg/L	4.0	R
RCF-TR-1-210618	8270D	N-Nitrosodi-n-propylamine	0.62	U	0.62	2.0	mg/L	2.0	R
RCF-TR-1-210618	8270D	N-Nitrosodiphenylamine	1.5	U	1.5	8.0	mg/L	8.0	U
RCF-TR-1-210618	8270D	Pentachlorophenol	16	U	16	80	mg/L	80	U
RCF-TR-1-210618	8270D	Phenanthrene	3.4	J	1.2	4.0	mg/L	3.4	J
RCF-TR-1-210618	8270D	Phenol	2.7	U	2.7	20	mg/L	20	U
RCF-TR-1-210618	8270D	Pyrene	2.7	J	1.7	4.0	mg/L	2.7	J
RCF-TR-1-210618	8270D	Unknown	30	T J			mg/L	30	J
RCF-TR-1-210618	8270D	Unknown	16	T J			mg/L	16	J
RCF-TR-1-210618	8270D	Unknown	22	T J			mg/L	22	J
RCF-TR-1-210618	8270D	Unknown	62	T J			mg/L	62	J
RCF-TR-1-210618	8270D	Unknown	65	T J			mg/L	65	J
RCF-TR-1-210618	8270D	Unknown	29	T J			mg/L	29	J

DATA VALIDATION CHECKLIST – STAGE 3

Site Name	Chemtool Fire Site - RS	**Project No.**	103X903100320001CF104
Document Tracking No.	0754C		
Data Reviewer (signature and date)	July 6, 2021 7/6/2021	**Technical Reviewer (signature and date)**	20 July 2021
Laboratory Report No.	500-201159-2	**Laboratory**	Eurofins/ University Park, IL
Analyses	Metals by EPA Method 6010B; Mercury by EPA Method 7471B; Volatile organic compounds by EPA Method 8260B; Semivolatile organic compounds by EPA Method 8270D		
Samples and Matrix	1 solid sample		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 3 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017), the *NFG for Organic Superfund Methods Data Review* (January 2017), and the above cited methods.

OVERALL EVALUATION

No rejection of results was required for this data package. The results may be used as qualified based on the findings of this validation effort.

Data completeness:

Within Criteria	Exceedance/Notes
N	EPA Method 6010B: The raw data from instrument ICP6 run on 6/24/2021 was missing from the laboratory report. The laboratory report was revised to include this data and the revision was reviewed for this validation report.

DATA VALIDATION CHECKLIST – STAGE 3

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	The sample was originally listed on the COC form, logged, and analyzed as a surface water sample in SDG 500-201159-1; however, due to laboratory difficulties with the sample matrix, it was re-extracted, analyzed, and reported in this SDG as a solid sample for comparison purposes.

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The %Ds exceeded the control limit of ≤20% with high responses for chloroethane (33.6%) and cyclohexane (23.1%). Sample results, both nondetects, were qualified as estimated (flagged UJ). EPA Method 8270D: The continuing calibration %Ds exceeded the control limit of ≤20% with high responses for benzaldehyde (102%) and caprolactam (21.5%). Sample results, both nondetects, were qualified as estimated (flagged UJ).

DATA VALIDATION CHECKLIST – STAGE 3

Calibration Verification:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The %D exceeded the control limit of ≤20% with a high response for dichlorodifluoromethane (33.7%). The nondetect sample result was qualified as estimated (flagged UJ). EPA Method 8270D: ICV %Ds exceeded the control limit of ≤20% with high responses for hexachlorobenzene (20.6%) and benzo(a)pyrene (21.5%). Results, both nondetects, were qualified as estimated (flagged UJ).

Method blanks:

Within Criteria	Exceedance/Notes
N	EPA Method 6010B: Zinc was present in a bracketing calibration blank, and cadmium and calcium were present in the method blank at greater than the MDL. The detected result for cadmium in the sample was below the RL and was qualified as nondetect (flagged U) at the RL. No further qualifications were required.

Field blanks:

Within Criteria	Exceedance/Notes
NA	

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	

DATA VALIDATION CHECKLIST – STAGE 3

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The LCS recovery was below the control limits of 56-132% for bromoform (55%) and below the control limits of 68-125% for dibromochloromethane (63%). Sample results, both nondetects, were qualified as estimated (flagged UJ).

DATA VALIDATION CHECKLIST – STAGE 3

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	EPA Method 8260B: According to the case narrative, due to the nature of the sample matrix the sample was analyzed at a 50-fold dilution. Chromatographic interference was not apparent. Reporting limits and MDLs were raised accordingly. EPA Method 8270D: According to the case narrative and preparation bench sheet for this SDG, due to the nature of the sample matrix, a greatly reduced sample weight was extracted (1 gram instead of 15 grams). Reporting limits and MDLs were raised accordingly. EPA Method 6010B: The sample was analyzed at a 5-fold dilution for aluminum.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
N	EPA Method 8270D: Internal standard perylene-d12 was recovered below the control limits of -50%/+100% (37%). Sample results for associated target compounds benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, all nondetects, were qualified as estimated (flagged UJ).

DATA VALIDATION CHECKLIST – STAGE 3

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	EPA Method 8270D: The COC form specifies PAHs (and TICs); however, the laboratory analyzed for 65 SVOCs. All detected SVOCs are PAHs.

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
N	All methods: Nondetects are reported at the RL in the laboratory report and at the MDL in the EDD. EPA Methods 8260B and 8270D: Results in the laboratory report are reported in units of µg/L and in the EDD are reported in units of mg/L. EPA Method 6010B: For all three ICP-AES initial calibrations in the laboratory report, the calibration standard values are reported only in (S)IR units, and the results for all other analyses are reported only in concentration units. Therefore, reported QC and field sample results could not be verified using the calibration curves. No data were qualified due to this circumstance.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The laboratory analyzed for TICs; however, none were detected in the sample. EPA Method 8270D: TICs identified as unknowns were qualified as estimated (flagged J) and named TICs were qualified as tentatively identified and estimated (flagged NJ).

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201159-2 6010B_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Initial Calibration	Confirm (in ICP raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).			
	Confirm (in ICP raw data) that an initial calibration occurs at the required frequency.			
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**06222021 16:45**	**blank plus one non-zero standard. See 500-201159-2 copper ICAL worksheet.**	✓
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**				
ICV	Check result **cobalt**	**06222021 17:05**	**rpt: 0.411 mg/L raw: 0.411**	✓
	Recalculate one %R	**rpt:103%**	**Calculated result:***0.411/0.4 = = 102.8%**	✓
ICB	Check result **selenium**	**06222021 17:08**	**rpt: <0.01 mg/l raw: 0.0014**	✓
CRDL Check Standard	Check result **lead**	**06222021 17:16**	**rpt:0.0102 mg/l raw: 0.0102**	✓
	Recalculate one %R	**rpt: 102%**	**Calculated result:*** 0.0102/0.01 = 102%**	✓
An opening CCV applicable to our samples	Check result **nickel**	**06222021 20:11**	**rpt: 0.509 mg/l raw: 0.509**	✓
	Recalculate one %R	**rpt: 102%**	**Calculated result:*** 0.509/0.5= 101.8%**	✓
A closing CCV applicable to our samples	Check result **chromium**	**06222021 20:51**	**rpt:0.495 mg/L raw: .4946**	✓
	Recalculate one %R	**rpt: 99%**	**Calculated result:*** .4946/.5= 98.9%**	✓
An opening CCB applicable to our samples	Check result **lithium**	**06222021 20:15**	**rpt:<0.01 raw: 0.00069**	✓
A closing CCB applicable to our samples	Check result **arsenic**	**06222021 20:54**	**rpt: <0.01 raw: 0.00073**	✓
Method blank	Check result **barium**	**06222021 19:14**	**rpt: <1 mg/kg raw: 0.0002 mg/l**	✓
	recalculate result		**Cacluated result: (0.0002)(0.1) = 0.02 mg/kg**	✓

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201159-2 6010B_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
ICSA sample	Check result **cadmium**	**06222021 17:19**	**rpt: 0.000 mg/l raw: -0.00047 mg/l**	✓
	Recalculate one %R	**NA**	**Calculated result:*** NA**	
ICSAB sample	Check result **cadmium**	**06222021 17:21**	**rpt: 0.979 mg/l raw: 0.979**	✓
	Recalculate one %R	**rpt: 98%**	**Calculated result:*** 0.979/1 = 97.9%**	✓
MS	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:****	
MSD	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:****	
	Recalculate one RPD value between MS and MSD		**Calculated result:**	
Post-digestion spike	Check result	**NA**		
	Recalculate one %R		**Calculated result:****	
LCS	Check result **chromium**	**06222021 19:17**	**Calculated result:* {.1903 mg/L)(0.1)= 19.03 mg/kg**	✓
	Recalculate one %R	**rpt: 95%**	**Calculated result:***19.03/20 = 95.2%**	✓
Serial Dilution	Check result	**NA**	**Calculated result:****	
	Recalculate one percent difference value		**Calculated result:**	
Sample result for selenium	Check result rpt: <1.1 mg/kg	**06222021 20:24**	**Calculated result: { 0.001 mg/L)(.0999)}/0.912= 0.00011 mg/kg**	✓
Sample result for magnesium	Check result rpt: 190 mg/kg	**06222021 20:24**	**Calculated result: {(1.765 mg/L)(.0999)}/0.912= 193.3 mg/kg**	✓
RL for beryllium	rpt: 0.44 mg/kg	**RCF-TR-210618**	**Calculated result:{0.4/0.912} * {0.1/0.0999} = .4386 mg/kg**	✓
MDL for beryllium	rpt: 0.10 mg/kg	**RCF-TR-210618**	**Calculated result:{0.0934/0.912} * {0.1/0.0999} = 0.102 mg/kg**	✓

Formulas:

* Conc. (mg/kg) = {(Raw Conc. in ug/L) x (Vol. in L) x DF} / {(Sample mass in kg) x (fractional solids) x (1000)}

** Serial dilution conc. (ug/L) = (Raw Conc. in ug/L) x (DF, typically 5)

*** %R = [(Measured Value) / (True Value)] x 100

**** %R = {(Spike sample result) - (Sample result)} / (Spike added)} x 100

RPD = [(A-B) / {(A + B)/2}] x 100

Percent difference = [(Original Result - Diluted Result) / Original Result] x 100

6010B
copper 06222021 CPS:ppb

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Response
0.0	0			0.01
1.0	1			1.05

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	99.80%	0.00%	0.00%	98908.95%	0.00%	#DIV/0!
	-99.80%	0.00%	0.00%	0.00%	0.00%	#DIV/0!
RSE in X:	141.1%	#DIV/0!	#DIV/0!	98908.9%	#DIV/0!	#DIV/0!

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r²	r
Weighted (1/Amt^2)						
Average		5.2002E+02		0	#########	#NUM!
Linear	1.0380E-02	1.0390E+00		-0.01	1.00000	1.00000
Weighted (1/Amt)						
Linear	1.0380E-02	1.0390E+00		-0.01	1.00000	1.00000
Unweighted						
Forced Zero		1.0494E+00		0	0.99990	0.99995
Linear	1.0380E-02	1.0390E+00		-0.01	1.00000	1.00000
Quadratic	-4.2863E-01	2.0000E+00	0.0000E+00	#DIV/0!	0.13820	0.37176
	c	b	a			

Sample Results

	ICV	LLCV	LCS	MB	Sample 1
Instrum.Responses:					
IS Response:					
Avg RF Result:	0.000	0.000	0.000	0.000	0.000
Linear(1/x2) Result:	-0.010	-0.010	-0.010	-0.010	-0.010
Linear(1/x) Result:	-0.010	-0.010	-0.010	-0.010	-0.010
Linear Forced:	0.000	0.000	0.000	0.000	0.000
Linear Result:	-0.010	-0.010	-0.010	-0.010	-0.010
Quad Result (no IS):	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Quad Result (with IS):					

Y = bX X = Y/b
Y = bX + c X = (Y-c)/b

Quadratic Sample Calcs

$y = ax^2 + bx + c$

$x = (-b \pm \sqrt{b^2-4a(c-y)})/2*a$

Intercept Calcul

2a =	0.0000E+00
c-y =	-4.2863E-01
4a(c-y) =	0.0000E+00
b*b =	4.0000E+00

Quad Without IS:

2a =	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
c-y =	-4.2863E-01	-4.2863E-01	-4.2863E-01	-4.2863E-01	-4.2863E-01
4a(c-y) =	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
b*b =	4.0000E+00	4.0000E+00	4.0000E+00	4.0000E+00	4.0000E+00

Quad With IS:

2a =	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
$y = A_{(s)}*Conc_{(is)} / A_{(is)} =$	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
c-y =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4a(c-y) =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b*b =	4.0000E+00	4.0000E+00	4.0000E+00	4.0000E+00	4.0000E+00

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201159-2 Method 7471B_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Initial Calibration	Confirm (in ICP raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).			
	Confirm (in ICP raw data) that an initial calibration occurs at the required frequency.			
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**06232021 06:03**	**blank plus six non-zero standards. See 500-201159-2 Hg ICAL worksheet**	✓
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**				
ICV	Check result mercury	**06232021 06:25**	**rpt: 2.14 ug/L raw: 2.139**	✓
	Recalculate one %R	**rpt: 106.98%**	**Calculated result:*** 2.139/2 = 106.98%**	✓
ICB	Check result	**06232021 06:27**	**rpt: <0.2 raw: 0.034**	✓
CRDL Check Standard	Check result	**06232021 06:29**	**rpt: 0.224 ug/L raw: 0.224**	✓
	Recalculate one %R	**rpt:112%**	**Calculated result:***0.224/0.2 = 112%**	✓
An opening CCV applicable to our samples	Check result	**06232021 09:17**	**rpt: 1.03 ug/L raw: 1.030**	✓
	Recalculate one %R	**rpt:103%**	**Calculated result:*** 1.030/1 = 103%**	✓
A closing CCV applicable to our samples	Check result	**06232021 09:50**	**rpt: 1.06 ug/L raw: 1.059**	✓
	Recalculate one %R	**rpt: 106%**	**Calculated result:*** 1.059/1= 105.9%**	✓
An opening CCB applicable to our samples	Check result	**06232021 09:19**	**rpt: <0.2 raw: 0.031**	✓
A closing CCB applicable to our samples	Check result	**06232021 09:52**	**rpt: <0.2 raw: 0.031**	✓

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201159-2 Method 7471B_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Method blank	Check result	**06232021 08:54**	**rpt: <0.017 mg/kg raw: 0.021 mg/l**	✓
	recalculate result		**Calculated result:* {0.021 ug/L) x (0.05 L) x DF} = 0.00105**	✓
ICSA sample	Check result	**NA**		
	Recalculate one %R	**NA**	**Calculated result:*****	
ICSAB sample	Check result	**NA**		
	Recalculate one %R	**NA**	**Calculated result:*****	
MS	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:******	
MSD	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:******	
	Recalculate one RPD value between MS and MSD		**Calculated result:**	
Post-digestion spike	Check result	**NA**		
	Recalculate one %R		**Calculated result:******	
LCS	Check result	**06232021 08:56**	**rpt: 2.0 raw: 2.104 {2.104 ug/L) x (0.05 L) x DF} = 0.175 mg/kg**	✓
	Recalculate one %R	**rpt: 105%**	**Calculated result:***0.175/0.167 = 104.8%**	✓
Serial Dilution	Check result	**NA**	**Calculated result:****	
	Recalculate one percent difference value		**Calculated result:**	
Sample result	Check result	**06232021 09:48**	**rpt: 0.49U raw:0.046 * {0.046 ug/L) x (0.05 L) x DF} / (0.6469g) x (0.912) = 0.003 mg/kg**	✓
MDL	rpt: 0.0057 mg/kg	**RCF-TR-210618**	**Calculated result:{0.00556/0.912} * {0.6/0.6469} = 00566 mg/kg**	✓
RL	rpt: 0.017 mg/kg	**RCF-TR-210618**	**Calculated result:{0.017/0.912} * {0.6/0.6469} = 0173 mg/kg**	✓

* Conc. (mg/kg) = {(Raw Conc. in ug/L) x (Vol. in L) x DF} / {(Sample mass in kg) x (fractional solids) x (1000)}

** Serial dilution conc. (ug/L) = (Raw Conc. in ug/L) x (DF, typically 5)

*** %R = [(Measured Value) / (True Value)] x 100

**** %R = {(Spike sample result) - (Sample result)} / (Spike added)} x 100

RPD = A-B]/{(A + B)/2} x 100

Percent difference = [(Original Result - Diluted Result) / Original Result] x 100

7471B
mercury 06232021 abs:ppb

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Response
0.0	286			286.00
0.2	2077			2077.00
0.5	3948			3948.00
1.0	8855			8855.00
3.0	25752			25752.00
5.0	42670			42670.00
10.0	85883			85883.00

Relative Errors in X

Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
598.71%	0.00%	7.43%	333264.29%	203696.41%	94807.63%
-99.75%	6.67%	5.35%	21.05%	14.77%	10.72%
-99.81%	-12.76%	-13.84%	-7.96%	-10.39%	-11.46%
-99.78%	2.07%	0.80%	3.21%	2.11%	2.24%
-99.79%	1.11%	-0.14%	0.06%	-0.19%	0.38%
-99.79%	0.97%	-0.28%	-0.53%	-0.60%	-0.17%
-99.79%	1.95%	0.69%	0.11%	0.17%	0.01%
RSE in X: 264.0%	6.6%	7.4%	136054.6%	91095.8%	47403.8%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r²	r
Weighted (1/Amt^2)						
Average		4.0933E+06		0	#########	#NUM!
Linear	2.8592E+02	8.3956E+03		-0.03	0.99944	0.99972
Weighted (1/Amt)						
Linear	2.8591E+02	8.5010E+03		-0.03	0.99988	0.99994
Unweighted						
Forced Zero		8.5792E+03		0	0.99995	0.99998
Linear	1.1149E+02	8.5630E+03		-0.01	0.99993	0.99996
Quadratic	2.0583E+02	8.4474E+03	1.1948E+01	-0.02	0.99994	0.99997
	c	b	a			

Sample Results

Instrum.Responses:	ICV 18432	CRA 2026	LCS 18127	MB 292	Sample 1 507
IS Response:					
Avg RF Result:	0.005	0.000	0.004	0.000	0.000
Linear(1/x2) Result:	2.161	0.207	2.125	0.001	0.026
Linear(1/x) Result:	2.135	0.205	2.099	0.001	0.026
Linear Forced:	2.148	0.236	2.113	0.034	0.059
Linear Result:	2.140	0.224	2.104	0.021	0.046
Quad Result (no IS):	2.151	0.215	2.115	0.010	0.036
Quad Result (with IS):					

Y = bX X = Y/b
Y = bX + c X = (Y-c)/b

Quadratic Sample Calcs

$y = ax^2 + bx + c$

$x = (-b \pm \sqrt{b^2-4a(c-y)})/2*a$

Intercept Calcul

2a =	2.3895E+01
c-y =	2.0583E+02
4a(c-y) =	9.8365E+03
b*b =	7.1359E+07

Quad Without IS:

2a =	2.3895E+01	2.3895E+01	2.3895E+01	2.3895E+01	2.3895E+01
c-y =	-1.8226E+04	-1.8202E+03	-1.7921E+04	-8.6173E+01	-3.0117E+02
4a(c-y) =	-8.7103E+05	-8.6986E+04	-8.5646E+05	-4.1182E+03	-1.4393E+04
b*b =	7.1359E+07	7.1359E+07	7.1359E+07	7.1359E+07	7.1359E+07

Quad With IS:

2a =	2.3895E+01	2.3895E+01	2.3895E+01	2.3895E+01	2.3895E+01
$y = A_{(s)}*Conc_{(is)} / A_{(is)}$ =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
c-y =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4a(c-y) =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b*b =	7.1359E+07	7.1359E+07	7.1359E+07	7.1359E+07	7.1359E+07

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201159-2_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
Initial Calibration	Confirm (in raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).	**Instrument CMS20 3/06/2021 multi-point calibration**	**See calibration spreadsheet**
	Confirm (in raw data) that an initial calibration occurs at the required frequency.	**Yes**	
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**reported 0.3016 TCE (Level 4)**	**Calculated RRF: I S 50 ppb std TCE 2ppb 7767*50/(643831*2)=0.30159**
			Calculated RRF: See calibration spreadsheet
			Calculated %RSD: See calibration spreadsheet

Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation.

SHOW ALL WORK FOR RECALCULATIONS

Tune	Confirm BFB Percent Relative Abundance	**06/23/2021 07:59 mass 50 reported 17.9% %**	**3679/20512*100=17.936%%**

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

DData Package Number: 201159-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
ICV	Check result	**CMS02 3/6/2021 22:08**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %R		
A CCV applicable to our samples	Check result	**CMS02 6/23/2021 09:16**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %D		
Method Blank	Check result	**All ND**	
Surrogate	Recalculate one %R	**6/23/10:58 RCF-TR-1 toluene-d8 reported 97%**	**48.4/50*100=96.8%**
MS	Check result	**N/A**	
	Recalculate one %R		
MSD	Check result	**N/A**	
	Recalculate one %R		
	Recalculate one RPD value between MS and MSD		

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201159-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
LCS	Check result	**605167/4 6/23/2021 10:11**	**See calibration spreadsheet.**
	Recalculate one %R	**TCE reported 86%**	**0.0430/0.050*100=86%**
LCSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between LCS and LCSD	**N/A**	
Internal Standards	Recalculate one %R	**fluorobenze RCF-TR-1**	**628325/640514*100=98.1%**
	Recalculate one delta RT	**fluorobenze RCF-TR-1**	**6.76-6.74=0.02 min.**
Sample Result for cis-1,2-DCE	Check result		**See calibration spreadsheet**
MDL for __RCF-TR-1_cis-1,2-DCE	Check result	**reported 0.024 mg/Kg**	**nominal MDL 0.00041 mg/Kg*50 (DF) /0.912 =0.022478**
RL for __RCF-TR-1_TCE	Check result	**reported 0.030 mg/Kg**	**nominal MDL [0.00050 mg/Kg*50 (DF)] /0.912=0.02741**
Convert µg/m^3 to ppbV (air only) for	Check result	**N/A**	

ICAL CMS02 3/06/2021
cis-1,2-dichloroethene

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
1.0	4855	50.0	701560	0.35
2.0	8285	50.0	643831	0.64
5.0	19786	50.0	625702	1.58
20.0	78529	50.0	623191	6.30
50.0	204234	50.0	640514	15.94
100.0	397580	50.0	640264	31.05
150.0	587948	50.0	612828	47.97
200.0	788818	50.0	649044	60.77

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	8.47%	1.00%	0.02%	11.60%	-55.42%	44.41%
	0.85%	-1.85%	-2.21%	3.76%	-29.52%	17.19%
	-0.87%	-0.65%	-0.62%	1.99%	-11.03%	3.69%
	-1.24%	0.45%	0.67%	1.61%	-1.29%	-2.13%
	-0.04%	1.97%	2.23%	2.84%	1.98%	-1.08%
	-2.67%	-0.62%	-0.35%	0.14%	-0.06%	-2.32%
	0.25%	2.40%	2.68%	3.15%	3.18%	2.65%
	-4.75%	-2.70%	-2.43%	-2.00%	-1.88%	-0.83%
RSE in X:	3.9%	1.9%	2.0%	5.0%	26.1%	21.4%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r^2	r
Weighted (1/Amt^2)						
Average		3.1899E-01		0	0.99863	0.99932
Linear	3.0798E-02	3.1210E-01		-0.10	0.99891	0.99945
Weighted (1/Amt)						
Linear	3.4728E-02	3.1122E-01		-0.11	0.99897	0.99948
Unweighted						
Forced Zero		3.1004E-01		0	0.99946	0.99973
Linear	2.0844E-01	3.0858E-01		-0.68	0.99904	0.99952
Quadratic	-1.3171E-01	3.3099E-01	-1.2074E-04	0.40	0.99944	0.99972
	c	b	a			

Sample Results

	ICV	CCV	LCS	Sample 4	Sample 5
Instrum.Responses:	184045	201080	199451		
IS Response:	584515	691577	706799		
Avg RF Result:	49.353	45.574	44.231	#DIV/0!	#DIV/0!
Linear(1/x2) Result:	50.345	46.482	45.110	#DIV/0!	#DIV/0!
Linear(1/x) Result:	50.475	46.601	45.225	#DIV/0!	#DIV/0!
Linear Forced:	50.778	46.890	45.508	#DIV/0!	#DIV/0!
Linear Result:	50.343	46.436	45.048	#DIV/0!	#DIV/0!
Quad Result (no IS):					
Quad Result (with IS):	48.833	45.061	43.724	#DIV/0!	#DIV/0!

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201159-2_8270D

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
Initial Calibration	Confirm (in raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).	**Instrument CMS24 6/23/2021 12:06 – 15:32 multi-point calibration**	**See calibration spreadsheet**
	Confirm (in raw data) that an initial calibration occurs at the required frequency.	**Yes**	
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**reported 0.9507 naphthalene**	**Calculated RRF: 1 ppb std 441261*3.2/1485317=0.95066**
			Calculated RRF: See calibration spreadsheet
			Calculated %RSD: See calibration spreadsheet
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**			
Tune	Confirm BFB Percent Relative Abundance	**06/24/2021 08:42 mass 275 reported 26.5%**	**145728/550656*100=26.464%%**

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: 201159-2_8270D

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
ICV	Check result	**CMS24 6/23/2021 15:53**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %R		
A CCV applicable to our samples	Check result	**CMS24 6/24/2021 09:02**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %D		
Method Blank	Check result	**All ND**	**All ND**
Surrogate	Recalculate one %R	**6/214 12:44 RCF-TR-1 Nitrobenzene d5 reported 103%**	**1.03/1.00*100=103.00**
MS	Check result	**N/A**	
	Recalculate one %R		
MSD	Check result	**N/A**	
	Recalculate one %R		
	Recalculate one RPD value between MS and MSD		

STAGE 3/4 DATA VALIDATION CHECKLIST FOR
RECALCULATIONS Data Package Number: 201159-2_8270BD

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
LCS	Check result	**605764/2 6/21/2021 14:44**	**See calibration spreadsheet.**
	Recalculate one %R	**naphthalene reported 91%**	**1.21/1.33*100=90.9774%**
LCSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between LCS and LCSD	**N/A**	
Internal Standards	Recalculate one %R	**NPT d8 RCF-TR-1**	**1409896/1149714*100=122.63%**
	Recalculate one delta RT	**NPT d8 RCF-TR-1**	**6.03-6.030=0.00 min.**
Sample Result for naphthalene	Check result		**See calibration spreadsheet**
MDL for __RCF-TR-1_naphthalene	Check result	**reported 0.81 mg/Kg**	**nominal MDL 0.0051 mg/Kg Blank 15g to 2.5 mL Sample 1.0343 g to 2.5 mL 10 DF 8.8%moisture = 0.8109985 mg/Kg**
RL for __RCF-TR-1_naphthalene	Check result	**reported 5.2 mg/Kg**	**nominal MDL 0.033 mg/Kg Blank 15g to 2.5 mL Sample 1.0343 g to 2.5 mL 10 DF 8.8%moisture =5.2476 mg/Kg**
Convert µg/m^3 to ppbV (air only) for	Check result	**N/A**	

ICAL CMS24 6/11/2021
naphthalene

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
0.2	92026	3.2	1512782	0.19
0.4	189241	3.2	1606558	0.38
1.0	441261	3.2	1485317	0.95
2.0	851929	3.2	1387232	1.97
4.0	1686615	3.2	1303123	4.14
8.0	3201760	3.2	1217393	8.42
10.0	3943070	3.2	1185190	10.65
12.0	4671895	3.2	1122409	13.32
14.0	5395976	3.2	1107953	15.58

Relative Errors in X

Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
-5.03%	4.09%	16.45%	-10.86%	72.96%	5.19%
-8.06%	-4.58%	0.12%	-13.69%	27.51%	-1.08%
-7.24%	-7.23%	-7.20%	-12.93%	2.67%	-2.55%
-4.13%	-5.33%	-6.96%	-10.01%	-2.99%	-0.91%
1.03%	-0.88%	-3.45%	-5.17%	-2.49%	1.96%
2.64%	0.42%	-2.60%	-3.65%	-3.13%	-0.37%
3.88%	1.56%	-1.58%	-2.50%	-2.42%	-1.01%
8.30%	5.84%	2.50%	1.66%	1.38%	1.09%
8.61%	6.12%	2.73%	1.95%	1.46%	-0.29%
RSE in X: 6.4%	5.3%	7.6%	8.8%	29.6%	2.6%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r^2	r
Weighted (1/Amt^2)						
Average		1.0249E+00		0	0.99555	0.99777
Linear	-2.4055E-02	1.0506E+00		0.02	0.99506	0.99753
Weighted (1/Amt)						
Linear	-5.8660E-02	1.0877E+00		0.05	0.99854	0.99927
Unweighted						
Forced Zero		1.0919E+00		0	0.99931	0.99965
Linear	-1.8947E-01	1.1105E+00		0.17	0.99896	0.99948
Quadratic	-1.1426E-02	9.7753E-01	1.0011E-02	0.01	0.99982	0.99991
	c	b	a			

Sample Results

	ICV	CCV	LCS	RCF-TR-1	Sample 5
Instrum.Responses:	3865714	2683283	2689569	64346	
IS Response:	1134884	1149714	1159519	1409896	
Avg RF Result:	10.635	7.287	7.242	0.142	#DIV/0!
Linear(1/x2) Result:	10.398	7.131	7.088	0.162	#DIV/0!
Linear(1/x) Result:	10.075	6.920	6.878	0.188	#DIV/0!
Linear Forced:	9.983	6.840	6.798	0.134	#DIV/0!
Linear Result:	9.986	6.896	6.855	0.302	#DIV/0!
Quad Result (no IS):					
Quad Result (with IS):	10.115	7.131	7.090	0.161	#DIV/0!

CHEMTOOL FIRE SITE - RS SOLID ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-2

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	6010B	Aluminum	99	J	45	110	mg/Kg	99	J
RCF-TR-1-210618	6010B	Antimony	3.1		0.43	2.2	mg/Kg	3.1	
RCF-TR-1-210618	6010B	Arsenic	0.37	U	0.37	1.1	mg/Kg	1.1	U
RCF-TR-1-210618	6010B	Barium	6.8		0.12	1.1	mg/Kg	6.8	
RCF-TR-1-210618	6010B	Beryllium	0.10	U	0.10	0.44	mg/Kg	0.44	U
RCF-TR-1-210618	6010B	Cadmium	0.079	J B	0.039	0.22	mg/Kg	0.22	U
RCF-TR-1-210618	6010B	Calcium	11000	B	3.7	22	mg/Kg	11000	
RCF-TR-1-210618	6010B	Chromium	0.54	U	0.54	1.1	mg/Kg	1.1	U
RCF-TR-1-210618	6010B	Cobalt	0.21	J	0.14	0.55	mg/Kg	0.21	J
RCF-TR-1-210618	6010B	Copper	2.3		0.31	1.1	mg/Kg	2.3	
RCF-TR-1-210618	6010B	Iron	140		11	22	mg/Kg	140	
RCF-TR-1-210618	6010B	Lead	0.39	J	0.25	0.55	mg/Kg	0.39	J
RCF-TR-1-210618	6010B	Lithium	17		0.33	1.1	mg/Kg	17	
RCF-TR-1-210618	6010B	Magnesium	190		5.4	11	mg/Kg	190	
RCF-TR-1-210618	6010B	Manganese	6.3		0.16	1.1	mg/Kg	6.3	
RCF-TR-1-210618	6010B	Nickel	0.49	J	0.32	1.1	mg/Kg	0.49	J
RCF-TR-1-210618	6010B	Potassium	58		19	55	mg/Kg	58	
RCF-TR-1-210618	6010B	Selenium	0.64	U	0.64	1.1	mg/Kg	1.1	U
RCF-TR-1-210618	6010B	Silver	0.12	U	0.12	0.46	mg/Kg	0.46	U
RCF-TR-1-210618	6010B	Sodium	93	J	16	110	mg/Kg	93	J
RCF-TR-1-210618	6010B	Thallium	0.55	U	0.55	1.1	mg/Kg	1.1	U
RCF-TR-1-210618	6010B	Vanadium	0.14	J	0.13	0.55	mg/Kg	0.14	J
RCF-TR-1-210618	6010B	Zinc	220		0.96	2.2	mg/Kg	220	
RCF-TR-1-210618	7471B	Mercury	0.0057	U	0.0057	0.017	mg/Kg	0.017	U
RCF-TR-1-210618	8260B	1,1,1-Trichloroethane	0.023	U	0.023	0.060	mg/Kg	0.060	UJ
RCF-TR-1-210618	8260B	1,1,2,2-Tetrachloroethane	0.024	U	0.024	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,1,2-Trichloro-1,2,2-trifluoroethane	0.027	U	0.027	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,1,2-Trichloroethane	0.021	U	0.021	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,1-Dichloroethane	0.024	U	0.024	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,1-Dichloroethene	0.023	U	0.023	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,2,4-Trichlorobenzene	0.020	U	0.020	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,2-Dibromo-3-Chloropropane	0.12	U	0.12	0.30	mg/Kg	0.30	U
RCF-TR-1-210618	8260B	1,2-Dibromoethane	0.023	U	0.023	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,2-Dichlorobenzene	0.020	U	0.020	0.060	mg/Kg	0.060	U

CHEMTOOL FIRE SITE - RS SOLID ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-2

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	8260B	1,2-Dichloroethane	0.023	U	0.023	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,2-Dichloropropane	0.026	U	0.026	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,3-Dichlorobenzene	0.024	U	0.024	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	1,4-Dichlorobenzene	0.022	U	0.022	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	2-Hexanone	0.093	U	0.093	0.30	mg/Kg	0.30	U
RCF-TR-1-210618	8260B	Acetone	0.10	U	0.10	0.60	mg/Kg	0.60	U
RCF-TR-1-210618	8260B	Benzene	0.0087	U	0.0087	0.015	mg/Kg	0.015	U
RCF-TR-1-210618	8260B	Bromodichloromethane	0.022	U	0.022	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Bromoform	0.029	U *-	0.029	0.060	mg/Kg	0.060	UJ
RCF-TR-1-210618	8260B	Bromomethane	0.047	U	0.047	0.18	mg/Kg	0.18	U
RCF-TR-1-210618	8260B	Carbon disulfide	0.048	U	0.048	0.12	mg/Kg	0.12	U
RCF-TR-1-210618	8260B	Carbon tetrachloride	0.023	U	0.023	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Chlorobenzene	0.023	U	0.023	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Chloroethane	0.030	U	0.030	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Chloroform	0.022	U	0.022	0.12	mg/Kg	0.12	U
RCF-TR-1-210618	8260B	Chloromethane	0.019	U	0.019	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	cis-1,2-Dichloroethene	0.024	U	0.024	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	cis-1,3-Dichloropropene	0.025	U	0.025	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Cyclohexane	0.029	U	0.029	0.060	mg/Kg	0.060	UJ
RCF-TR-1-210618	8260B	Dibromochloromethane	0.029	U *-	0.029	0.060	mg/Kg	0.060	UJ
RCF-TR-1-210618	8260B	Dichlorodifluoromethane	0.040	U	0.040	0.18	mg/Kg	0.18	UJ
RCF-TR-1-210618	8260B	Ethylbenzene	0.011	U	0.011	0.015	mg/Kg	0.015	U
RCF-TR-1-210618	8260B	Isopropylbenzene	0.023	U	0.023	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Methyl acetate	0.12	U	0.12	0.30	mg/Kg	0.30	U
RCF-TR-1-210618	8260B	Methyl Ethyl Ketone	0.13	U	0.13	0.30	mg/Kg	0.30	U
RCF-TR-1-210618	8260B	methyl isobutyl ketone	0.13	U	0.13	0.30	mg/Kg	0.30	U
RCF-TR-1-210618	8260B	Methyl tert-butyl ether	0.023	U	0.023	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Methylcyclohexane	0.019	U	0.019	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Methylene Chloride	0.097	U	0.097	0.30	mg/Kg	0.30	U
RCF-TR-1-210618	8260B	Styrene	0.023	U	0.023	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Tentatively Identified Compound	None				mg/Kg	None	
RCF-TR-1-210618	8260B	Tetrachloroethene	0.022	U	0.022	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Toluene	0.0088	U	0.0088	0.015	mg/Kg	0.015	U
RCF-TR-1-210618	8260B	trans-1,2-Dichloroethene	0.021	U	0.021	0.060	mg/Kg	0.060	U

CHEMTOOL FIRE SITE - RS SOLID ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-2

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	8260B	trans-1,3-Dichloropropene	0.022	U	0.022	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Trichloroethene	0.0098	U	0.0098	0.030	mg/Kg	0.030	U
RCF-TR-1-210618	8260B	Trichlorofluoromethane	0.026	U	0.026	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Vinyl chloride	0.016	U	0.016	0.060	mg/Kg	0.060	U
RCF-TR-1-210618	8260B	Xylenes, Total	0.013	U	0.013	0.030	mg/Kg	0.030	U
RCF-TR-1-210618	8270D	1,1'-Biphenyl	6.4	U	6.4	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	2,2'-oxybis[1-chloropropane]	6.1	U	6.1	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	2,4,5-Trichlorophenol	12	U	12	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	2,4,6-Trichlorophenol	18	U	18	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	2,4-Dichlorophenol	13	U	13	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	2,4-Dimethylphenol	20	U	20	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	2,4-Dinitrophenol	93	U	93	110	mg/Kg	110	U
RCF-TR-1-210618	8270D	2,4-Dinitrotoluene	8.4	U	8.4	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	2,6-Dinitrotoluene	10	U	10	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	2-Chloronaphthalene	5.8	U	5.8	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	2-Chlorophenol	9.0	U	9.0	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	2-Methylnaphthalene	2.7	J	0.97	11	mg/Kg	2.7	J
RCF-TR-1-210618	8270D	2-Methylphenol	8.5	U	8.5	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	2-Nitroaniline	7.1	U	7.1	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	2-Nitrophenol	12	U	12	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	3 & 4 Methylphenol	8.8	U	8.8	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	3,3'-Dichlorobenzidine	7.4	U	7.4	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	3-Nitroaniline	16	U	16	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	4,6-Dinitro-2-methylphenol	42	U	42	110	mg/Kg	110	U
RCF-TR-1-210618	8270D	4-Bromophenyl phenyl ether	7.0	U	7.0	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	4-Chloro-3-methylphenol	20	J	18	52	mg/Kg	20	J
RCF-TR-1-210618	8270D	4-Chloroaniline	25	U	25	110	mg/Kg	110	U
RCF-TR-1-210618	8270D	4-Chlorophenyl phenyl ether	6.2	U	6.2	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	4-Nitroaniline	22	U	22	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	4-Nitrophenol	50	U	50	110	mg/Kg	110	U
RCF-TR-1-210618	8270D	Acenaphthene	0.98	J	0.95	5.2	mg/Kg	0.98	J
RCF-TR-1-210618	8270D	Acenaphthylene	5.3		0.70	5.2	mg/Kg	5.3	
RCF-TR-1-210618	8270D	Acetophenone	13	U	13	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	Acrylamide	27000	J	27000	110000	ug/Kg	27000	NJ

CHEMTOOL FIRE SITE - RS SOLID ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-2

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	8270D	Anthracene	0.88	U	0.88	5.2	mg/Kg	5.2	U
RCF-TR-1-210618	8270D	Atrazine	15	U	15	52	mg/Kg	52	U
RCF-TR-1-210618	8270D	Benzaldehyde	52	U	52	210	mg/Kg	210	UJ
RCF-TR-1-210618	8270D	Benzo[a]anthracene	0.71	U	0.71	5.2	mg/Kg	5.2	U
RCF-TR-1-210618	8270D	Benzo[a]pyrene	1.0	U *3	1.0	5.2	mg/Kg	5.2	UJ
RCF-TR-1-210618	8270D	Benzo[b]fluoranthene	1.1	U *3	1.1	5.2	mg/Kg	5.2	UJ
RCF-TR-1-210618	8270D	Benzo[g,h,i]perylene	1.7	U *3	1.7	5.2	mg/Kg	5.2	UJ
RCF-TR-1-210618	8270D	Benzo[k]fluoranthene	1.6	U *3	1.6	5.2	mg/Kg	5.2	UJ
RCF-TR-1-210618	8270D	Bis(2-chloroethoxy)methane	5.4	U	5.4	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Bis(2-chloroethyl)ether	7.9	U	7.9	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Bis(2-ethylhexyl) phthalate	9.6	U	9.6	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Butyl benzyl phthalate	10	U	10	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Caprolactam	16	U	16	52	mg/Kg	52	UJ
RCF-TR-1-210618	8270D	Carbazole	13	U	13	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Chrysene	1.4	U	1.4	5.2	mg/Kg	5.2	U
RCF-TR-1-210618	8270D	Cyclododecane	210	T J N			mg/Kg	210	NJ
RCF-TR-1-210618	8270D	Cyclohexane	28	T J N			mg/Kg	28	NJ
RCF-TR-1-210618	8270D	Dibenz(a,h)anthracene	1.0	U *3	1.0	5.2	mg/Kg	5.2	UJ
RCF-TR-1-210618	8270D	Dibenzofuran	6.2	U	6.2	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Diethyl phthalate	8.9	U	8.9	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Dimethyl phthalate	6.9	U	6.9	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Di-n-butyl phthalate	8.0	U	8.0	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Di-n-octyl phthalate	8.6	U	8.6	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Ethanol, 2-(2-butoxyethoxy)-	42	T J N			mg/Kg	42	NJ
RCF-TR-1-210618	8270D	Fluoranthene	0.98	U	0.98	5.2	mg/Kg	5.2	U
RCF-TR-1-210618	8270D	Fluorene	0.74	U	0.74	5.2	mg/Kg	5.2	U
RCF-TR-1-210618	8270D	Hexachlorobenzene	1.2	U	1.2	11	mg/Kg	11	UJ
RCF-TR-1-210618	8270D	Hexachlorobutadiene	8.3	U	8.3	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Hexachlorocyclopentadiene	30	U	30	110	mg/Kg	110	U
RCF-TR-1-210618	8270D	Hexachloroethane	8.0	U	8.0	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Hexadecane	83000		16000	52000	ug/Kg	83000	NJ
RCF-TR-1-210618	8270D	Indeno[1,2,3-cd]pyrene	1.4	U *3	1.4	5.2	mg/Kg	5.2	UJ
RCF-TR-1-210618	8270D	Isophorone	5.9	U	5.9	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Naphthalene	3.8	J	0.81	5.2	mg/Kg	3.8	J

CHEMTOOL FIRE SITE - RS SOLID ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201159-2

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-TR-1-210618	8270D	Nitrobenzene	1.3	U	1.3	5.2	mg/Kg	5.2	U
RCF-TR-1-210618	8270D	N-Nitrosodi-n-propylamine	6.5	U	6.5	11	mg/Kg	11	U
RCF-TR-1-210618	8270D	N-Nitrosodiphenylamine	6.2	U	6.2	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	n-Octadecane	63000		20000	52000	ug/Kg	63000	NJ
RCF-TR-1-210618	8270D	Pentachlorophenol	85	U	85	110	mg/Kg	110	U
RCF-TR-1-210618	8270D	Phenanthrene	7.2		0.74	5.2	mg/Kg	7.2	
RCF-TR-1-210618	8270D	Phenol	12	U	12	27	mg/Kg	27	U
RCF-TR-1-210618	8270D	Pyrene	1.0	U	1.0	5.2	mg/Kg	5.2	U
RCF-TR-1-210618	8270D	Tetradecane	31	T J N			mg/Kg	31	NJ
RCF-TR-1-210618	8270D	Unknown	40	T J			mg/Kg	40	J
RCF-TR-1-210618	8270D	Unknown	39	T J			mg/Kg	39	J
RCF-TR-1-210618	8270D	Unknown	72	T J			mg/Kg	72	J

DATA VALIDATION CHECKLIST – STAGE 3

Site Name	Chemtool Fire Site - RS	**Project No.**	103X903100320001CF104
Document Tracking No.	0754D		
Data Reviewer (signature and date)	July 7, 2021 July 16, 2021 July 7, 2021	**Technical Reviewer (signature and date)**	20 July 2021
Laboratory Report No.	500-201178-1	**Laboratory**	Eurofins TestAmerica / University Park, IL, and Eurofins TestAmerica /Sacramento, CA
Analyses	Perfluoroalkyl substances (PFAS) by EPA Method 537 (modified); Metals by EPA Method 6020A; Mercury by EPA Method 7470A; Volatile organic compounds (VOC) by EPA Method 8260B; Semivolatile organic compounds (SVOC) by EPA Method 8270D		
Samples and Matrix	2 aqueous samples including 1 field blank		
Field Duplicate Pairs	None		
Field Blanks	RCF-FB-2-210619		

INTRODUCTION

This checklist summarizes the Stage 3 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review* (January 2017), the *NFG for Organic Superfund Methods Data Review* (January 2017), and the above cited methods.

OVERALL EVALUATION

One Method 8270D result was rejected due to no recovery of benzaldehyde for the LCS/LCSD. The remaining results may be used as qualified based on the findings of this validation effort.

DATA VALIDATION CHECKLIST – STAGE 3

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
N	The chain-of-custody (COC) form requested "6020 TAL metals + Lithium". The laboratory additionally performed and reported mercury by EPA Method 7470A, which was reviewed for this validation report. Although the COC form does not indicate preservation methods, the case narrative states that the samples were received properly preserved. The COC form included in the laboratory report is designated for CT Laboratories. The samples were received outside of temperature requirements at 21.5°C, one day past the delivery date recorded by FedEx. The laboratory was instructed by the client to proceed with requested analyses; however, due to the volatile nature of the EPA Method 8260B analytes, detected VOC sample results were qualified as estimated with a potential low bias (flagged J-), and nondetects as estimated (flagged UJ).

Instrument Performance Checks:

Within Criteria	Exceedance/Notes
Y	EPA Method 6020A: For the Agilent instrument (ICPMS4) used to analyze samples for metals by EPA Method 6020A, the laboratory checked the tune of the instrument according to the laboratory's standard operating procedure (SOP). The SOP specifies checking the tune in helium (He) mode using the masses 59, 89, and 205, and checking the tune in no-gas mode using the masses 7, 89, and 205. The He mode was used to determine the analyte concentrations for the sample. As such, the validator was concerned that the tune in He mode did not include mass 7, which would have extended the tune check down into the range of masses characteristic of some of the low-mass target analytes. The laboratory was contacted about this concern and responded by providing the aforementioned laboratory SOP. Because the laboratory conducted its tunes according to the laboratory SOP, no qualifications of sample results for analytes of low atomic masses were considered warranted. This circumstance potentially affects lithium, beryllium, boron, magnesium, aluminum, potassium, calcium, titanium, chromium, manganese, and iron.

DATA VALIDATION CHECKLIST – STAGE 3

Initial Calibration:

Within Criteria	Exceedance/Notes
Y	

Continuing Calibration:

Within Criteria	Exceedance/Notes
N	EPA Method 8270D: The CCV %D exceeded the control limit of ≤20% with a high response for benzaldehyde (82.6%). The nondetect sample result for benzaldehyde was qualified as estimated (flagged UJ). This result was subsequently rejected (see LCS/LCSD section) and was not further qualified for the %D outlier.

Calibration Verification:

Within Criteria	Exceedance/Notes
Y	

Method blanks:

Within Criteria	Exceedance/Notes
N	EPA Method 6020A: Lithium was present in the initial and continuing calibration blanks. The sample result for lithium was a detection at >10× the calibration blank concentrations and was not qualified. It should be noted that negative values were not reported in the QC summaries or raw data for instruments ICPMS2 and ICPMS4; therefore, negative blank values could not be evaluated against the sample results for target analytes except nickel and sodium.

Field blanks:

Within Criteria	Exceedance/Notes
Y	Field Blank RCF-FB-2-210619 was only analyzed for PFAS by Method 537 (modified). No target analytes were detected.

DATA VALIDATION CHECKLIST – STAGE 3

Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
N	EPA Method 6020A: Barium, cadmium, cobalt, and nickel were present in the ICSA at greater than MDL. One or more interferents were present in the project sample at concentrations comparable to those of the ICS. The sample result for cadmium was <10× the ICSA concentration and was qualified as estimated with possible high bias (flagged J+).

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	EPA Method 8270D: Due to dilution, the surrogates were considered diluted out and recoveries were not evaluated. EPA Method 537 (modified): The recoveries of M2 4:2 FTS and M2 6:2 FTS exceeded their QC limits for sample RCF-DR-1-210619, apparently due to interference caused by the very high concentration of 6:2 FTS in the sample. Therefore, the concentration of 6:2 FTS was qualified as estimated with a possible high bias (flagged J+). Target compound 4:2 FTS was not detected in the sample, so no further qualification was applied.

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

DATA VALIDATION CHECKLIST – STAGE 3

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
N	EPA Method 8260B: The LCS recovery was below the control limits of 56-123% for 1,2-dibromo-3-chloropropane (53%). The nondetect sample result for 1,2-dibromo-3-chloropropane was qualified as estimated (flagged UJ). EPA Method 8270D: Benzaldehyde was either not spiked inor was not detected or reported for the LCS/LCSD; therefore, the nondetect sample result was rejected (flagged R).

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	EPA Method 6020A: The sample was analyzed at a five-fold dilution for lithium. EPA Method 8260B: The sample was reanalyzed at a 5× dilution to report acetone within the linear range of the calibration. Remaining results were reported from the undiluted analysis. EPA Method 8270D: The sample was analyzed at a 10× dilution. According to the case narrative, this is due to the nature of the sample matrix.

DATA VALIDATION CHECKLIST – STAGE 3

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	

Internal Standards:

Within Criteria	Exceedance/Notes
N	EPA Method 8270D: Internal standard perylene-d12 was recovered below the control limits of -50%/+100% (23%). Sample results for associated target compounds benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, all nondetects, were qualified as estimated (flagged UJ).

Target analyte identification:

Within Criteria	Exceedance/Notes
Y	

Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Sample results were verified; results were found to be acceptable. All methods: The following inconsistencies were noted. Nondetects were reported at the RL in the laboratory report and at the MDL in the EDD.

	EPA Method 6020A: It should be noted that negative values were not reported in the QC summaries or in the raw data for instruments ICPMS2 and ICPMS4; therefore, negative values could not be evaluated against the MDLs for target analytes except for nickel and sodium. EPA Method 537 (modified): The concentration of analyte 6:2 FTS in sample RCF-DR-1-210619 exceeded instrument calibration range, but the peak did not saturate the detector so the sample was not re-analyzed at a dilution. The sample result for 6:2 FTS was qualified as estimated (flagged J).

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
Y	EPA Methods 8260B and 8270D: TICs were reported by the laboratory. Those with a library fit of ≥85% were named and qualified as tentatively identified and estimated (flagged NJ). Remaining TICs were reported as unknowns and were qualified as estimated (flagged J). The EPA Method 8260B dilution analysis for acetone had no detected TICs (TICs were reported in the undiluted analysis).

System performance and instrument stability:

Within Criteria	Exceedance/Notes
Y	

Other [specify]:

Within Criteria	Exceedance/Notes
NA	

DATA VALIDATION CHECKLIST – STAGE 3

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201178-1 6020A_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Initial Calibration	Confirm (in ICP raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).			
	Confirm (in ICP raw data) that an initial calibration occurs at the required frequency.			
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**06222021 11:08**	**blank plus three non-zero standards. See 500-201178-1 chromium ICAL worksheet.**	✓
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**				
ICV	Check result **cobalt**	**06222021 11:25**	**rpt: 210 ug/L raw: 210.1**	✓
	Recalculate one %R	**rpt:105%**	**Calculated result:***210.1/200 = 105.1%**	✓
ICB	Check result **selenium**	**06222021 11:29**	**rpt: <2.5 ug/l raw: 0.090**	✓
CRDL Check Standard	Check result **lead**	**06222021 11:46**	**rpt:.979 ug/l raw: 0.979**	✓
	Recalculate one %R	**rpt: 98%**	**Calculated result:*** .979/1 = 98%**	✓
An opening CCV applicable to our samples	Check result **thallium**	**06222021 11:49**	**rpt:251 ug/l raw: 250.7**	✓
	Recalculate one %R	**rpt: 100%**	**Calculated result:*** 250.7/250 = 100.3%**	✓
A closing CCV applicable to our samples	Check result **chromium**	**06222021 12:20**	**rpt:257 ug/L raw: 257.1**	✓
	Recalculate one %R	**rpt: 103%**	**Calculated result:*** 257.1/250 = 102.8%**	✓
An opening CCB applicable to our samples	Check result **lithium**	**06222021 11:53**	**rpt:<2.0 ug/l raw: 0.249**	✓
A closing CCB applicable to our samples	Check result **arsenic**	**06222021 12:33**	**rpt: <1.0 raw: 0.032**	✓
Method blank	Check result **barium**	**06222021 11:56**	**rpt: <0.0025 mg/l raw: <0.000 ug/l**	✓
	recalculate result		**Cacluated result: NA**	

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201178-1 6020A_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
ICSA sample	Check result **cadmium**	**06222021 11:36**	**rpt: 0.216 ug/l** **raw: 0.216 ug/l**	✓
	Recalculate one %R	**NA**	**Calculated result:*** NA**	
ICSAB sample	Check result **cadmium**	**06222021 11:39**	**rpt: 20.0 ug/l** **raw: 20.03**	✓
	Recalculate one %R	**rpt: 100%**	**Calculated result:*** 20.03/20 = 100%**	✓
MS	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:****	
MSD	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:****	
	Recalculate one RPD value between MS and MSD		**Calculated result:**	
Post-digestion spike	Check result	**NA**		
	Recalculate one %R		**Calculated result:****	
LCS	Check result **chromium**	**06222021 11:59**	**Calculated result:* NA** **rpt: 0.220 mg/l** **raw: 219.6 ug/l**	✓
	Recalculate one %R	**rpt: 110%**	**Calculated result:***219.6/200 = 109.8%**	✓
Serial Dilution	Check result	**NA**	**Calculated result:****	
	Recalculate one percent difference value		**Calculated result:**	
Sample result for selenium	Check result rpt:0.002 mg/l	**06222021 12:10**	**Calculated result: NA** **raw: 1.984 ug/l**	✓
Sample result for magnesium	Check result rpt: 54 mg/l	**06222021 12:10**	**Calculated result: NA** **raw:53732ug/l**	✓
RL for beryllium	rpt: 0.001 mg/l	**RCF-DR-1-210619**	**Calculated result:NA**	✓
MDL for beryllium	rpt: 0.00053 mg/l	**RCF-DR-1-210619**	**Calculated result:NA**	✓

Formulas:

* Conc. (mg/kg) = {(Raw Conc. in ug/L) x (Vol. in L) x DF} / {(Sample mass in kg) x (fractional solids) x (1000)}

** Serial dilution conc. (ug/L) = (Raw Conc. in ug/L) x (DF, typically 5)

*** %R = [(Measured Value) / (True Value)] x 100

**** %R = {(Spike sample result) - (Sample result)} / (Spike added)} x 100

RPD = [(A-B) / {(A + B)/2}] x 100

Percent difference = [(Original Result - Diluted Result) / Original Result] x 100

6020A
chromium ICPMS4 062 CPS:ppb

Input Calibration Data / **Relative Errors in X**

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
0.0	4624	1.0	100199	0.05	299.97%	0.00%	-4.09%	4164679.85%	##########	-1287773.42%
10.0	125644	1.0	105152	1.19	-99.99%	2.19%	3.58%	7.83%	-0.40%	1.46%
100.0	1199397	1.0	106926	11.22	-99.99%	-0.63%	0.73%	1.23%	0.58%	-0.02%
500.0	5687230	1.0	102701	55.38	-99.99%	-1.56%	-0.22%	-0.05%	-0.02%	0.00%
RSE in X:					200.0%	2.0%	3.9%	2404479.0%	3019821.4%	1287773.4%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r²	r
Weighted (1/Amt^2)						
Average		1.1538E+03		0	#########	#NUM!
Linear	4.6149E-02	1.1241E-01		-0.41	0.99962	0.99981
Weighted (1/Amt)						
Linear	4.6149E-02	1.1090E-01		-0.42	0.99999	0.99999
Unweighted						
Forced Zero		1.1081E-01		0	0.99999	1.00000
Linear	9.3380E-02	1.1059E-01		-0.84	1.00000	1.00000
Quadratic	6.0550E-02	1.1182E-01	-2.3826E-06	-0.54	1.00000	1.00000
	c	b	a			

Sample Results

Instrum.Responses:	ICV 2349274	LLCV 59838	LCS 2312282	MB 3627	Sample 1 265244
IS Response:	100439.9	96625	94493.4	91436.1	83902.7
Avg RF Result:	0.020	0.001	0.021	0.000	0.003
Linear(1/x2) Result:	207.658	5.098	217.270	-0.058	27.712
Linear(1/x) Result:	210.490	5.168	220.232	-0.058	28.090
Linear Forced:	211.079	5.589	220.829	0.358	28.529
Linear Result:	210.652	4.755	220.422	-0.486	27.741
Quad Result (no IS):					
Quad Result (with IS):	209.562	4.997	219.313	-0.187	27.746

Y = bX X = Y/b
Y = bX + c X = (Y-c)/b

Quadratic Sample Calcs

$y = ax^2 + bx + c$

$x = (-b \pm \sqrt{b^2-4a(c-y)})/2*a$

Intercept Calcul

2a =	-4.7652E-06
c-y =	6.0550E-02
4a(c-y) =	-5.7706E-07
b*b =	1.2504E-02

Quad Without IS:

2a =	-4.7652E-06	-4.7652E-06	-4.7652E-06	-4.7652E-06	-4.7652E-06
c-y =	-2.3493E+06	-5.9838E+04	-2.3123E+06	-3.6271E+03	-2.6524E+05
4a(c-y) =	2.2389E+01	5.7028E-01	2.2037E+01	3.4568E-02	2.5279E+00
b*b =	1.2504E-02	1.2504E-02	1.2504E-02	1.2504E-02	1.2504E-02

Quad With IS:

2a =	-4.7652E-06	-4.7652E-06	-4.7652E-06	-4.7652E-06	-4.7652E-06
$y = A_{(s)}*Conc_{(is)} / A_{(is)}$ =	23.38984607	0.619282794	24.47030269	0.039669233	3.161327347
c-y =	-2.3329E+01	-5.5873E-01	-2.4410E+01	2.0880E-02	-3.1008E+00
4a(c-y) =	2.2234E-04	5.3249E-06	2.3263E-04	-1.9900E-07	2.9551E-05
b*b =	1.2504E-02	1.2504E-02	1.2504E-02	1.2504E-02	1.2504E-02

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201178-1 Method 7470_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Initial Calibration	Confirm (in ICP raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).			
	Confirm (in ICP raw data) that an initial calibration occurs at the required frequency.			
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**06222021 06:49**	**blank plus six non-zero standards. See 500-201178-1 Hg ICAL worksheet**	✓
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**				
ICV	Check result mercury	**06222021 07:10**	**rpt: 1.95 ug/L raw: 1.949**	✓
	Recalculate one %R	**rpt: 97.43%**	**Calculated result:*** 1.949/2 = 97.43**	✓
ICB	Check result	**06222021 07:13**	**rpt: <0.20 raw: -0.047**	✓
CRDL Check Standard	Check result	**06222021 07:15**	**rpt: 0.165 ug/L raw: 0.165**	✓
	Recalculate one %R	**rpt:82%**	**Calculated result:***0.165/0.2 = 82.5%**	✓
An opening CCV applicable to our samples	Check result	**06222021 09:25**	**rpt: 1.02 ug/L raw: 1.015**	✓
	Recalculate one %R	**rpt:102%**	**Calculated result:*** 1.015/1 = 101.5%**	✓
A closing CCV applicable to our samples	Check result	**06222021 09:40**	**rpt: 1.00 ug/L raw: 1.001**	✓
	Recalculate one %R	**rpt: 100%**	**Calculated result:*** 1.001/1= 100%**	✓
An opening CCB applicable to our samples	Check result	**06222021 09:28**	**rpt: <0.2 raw: -0.006**	✓
A closing CCB applicable to our samples	Check result	**06222021 09:43**	**rpt: <0.2 raw: -0.005**	✓

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS
Data Package Number: __500-201178-1 Method 7470_____

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)	
Method blank	Check result	**06222021 08:49**	**rpt: <0.2 ug/l raw: -0.033**	✓
	recalculate result		**Calculated result:* NA**	
ICSA sample	Check result	**NA**		
	Recalculate one %R	**NA**	**Calculated result:*****	
ICSAB sample	Check result	**NA**		
	Recalculate one %R	**NA**	**Calculated result:*****	
MS	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:******	
MSD	Check result	**NA**	**Calculated result:***	
	Recalculate one %R		**Calculated result:******	
	Recalculate one RPD value between MS and MSD		**Calculated result:**	
Post-digestion spike	Check result	**NA**		
	Recalculate one %R		**Calculated result:******	
LCS	Check result	**06222021 08:51**	**rpt: 1.94 raw: 1.936**	✓
	Recalculate one %R	**rpt: 97%**	**Calculated result:***1.94/2.0 = 97%**	✓
Serial Dilution	Check result	**NA**	**Calculated result:****	
	Recalculate one percent difference value		**Calculated result:**	
Sample result	Check result	**06222021 09:38**	**rpt: <0.001 mg/L raw:0.000**	✓
MDL	rpt: 0.00049 mg/l	**RCF-DR-210619**	**Calculated result:(0.0984)(5)/1000 =0.000492 mg/l**	✓
RL for	rpt: 0.0010 mg/l	**RCF-DR-210619**	**Calculated result:(0.20)(5)/1000 = .0010 mg/l**	✓

* Conc. (mg/kg) = {(Raw Conc. in ug/L) x (Vol. in L) x DF} / {(Sample mass in kg) x (fractional solids) x (1000)}
** Serial dilution conc. (ug/L) = (Raw Conc. in ug/L) x (DF, typically 5)
*** %R = [(Measured Value) / (True Value)] x 100
**** %R = {(Spike sample result) - (Sample result)} / (Spike added)} x 100
RPD = A-B]/{(A + B)/2} x 100
Percent difference = [(Original Result - Diluted Result) / Original Result] x 100

7470A
mercury 06222021 abs:ppb

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Response
0.0	410			410.00
0.2	1984			1984.00
0.5	4267			4267.00
1.0	8284			8284.00
3.0	24987			24987.00
5.0	40141			40141.00
10.0	80730			80730.00

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	599.13%	0.00%	5.89%	507030.18%	48044.40%	44789.06%
	-99.83%	-0.85%	-1.83%	22.70%	0.41%	0.28%
	-99.85%	-2.82%	-3.78%	5.56%	-2.98%	-3.01%
	-99.86%	-0.81%	-1.78%	2.47%	-1.47%	-1.47%
	-99.86%	3.20%	2.19%	3.02%	2.17%	2.19%
	-99.86%	0.10%	-0.88%	-0.70%	-0.96%	-0.94%
	-99.86%	1.18%	0.19%	-0.14%	0.07%	0.06%
RSE in X:	264.2%	2.0%	3.5%	206994.2%	21486.1%	22394.5%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r²	r
Weighted (1/Amt^2)						
Average		5.8645E+06		0	#########	#NUM!
Linear	4.0992E+02	7.9382E+03		-0.05	0.99971	0.99986
Weighted (1/Amt)						
Linear	4.0992E+02	8.0169E+03		-0.05	0.99991	0.99995
Unweighted						
Forced Zero		8.0847E+03		0	0.99988	0.99994
Linear	3.7134E+02	8.0306E+03		-0.05	0.99991	0.99996
Quadratic	3.7397E+02	8.0274E+03	3.3292E-01	-0.05	0.99991	0.99996
	c	b	a			

Sample Results

	ICV	LLCV	LCS	MB	Sample 1
Instrum.Responses:	16020	1695	15922	195	371
IS Response:					
Avg RF Result:	0.003	0.000	0.003	0.000	0.000
Linear(1/x2) Result:	1.966	0.162	1.954	-0.027	-0.005
Linear(1/x) Result:	1.947	0.160	1.935	-0.027	-0.005
Linear Forced:	1.982	0.210	1.969	0.024	0.046
Linear Result:	1.949	0.165	1.936	-0.022	0.000
Quad Result (no IS):	1.949	0.165	1.937	-0.022	0.000
Quad Result (with IS):					

Y = bX X = Y/b
Y = bX + c X = (Y-c)/b

Quadratic Sample Calcs

$y = ax^2 + bx + c$

$x = (-b \pm \sqrt{b^2-4a(c-y)})/2*a$

Intercept Calcul

2a =	6.6584E-01
c-y =	3.7397E+02
4a(c-y) =	4.9800E+02
b*b =	6.4439E+07

Quad Without IS:

2a =	6.6584E-01	6.6584E-01	6.6584E-01	6.6584E-01	6.6584E-01
c-y =	-1.5646E+04	-1.3210E+03	-1.5548E+04	1.7897E+02	2.9657E+00
4a(c-y) =	-2.0835E+04	-1.7592E+03	-2.0705E+04	2.3832E+02	3.9493E+00
b*b =	6.4439E+07	6.4439E+07	6.4439E+07	6.4439E+07	6.4439E+07

Quad With IS:

2a =	6.6584E-01	6.6584E-01	6.6584E-01	6.6584E-01	6.6584E-01
$y = A_{(s)}*Conc_{(is)} / A_{(is)}$ =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
c-y =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4a(c-y) =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
b*b =	6.4439E+07	6.4439E+07	6.4439E+07	6.4439E+07	6.4439E+07

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201178-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
Initial Calibration	Confirm (in raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).	**Instrument CMS19 10/9/2020 8-point calibration**	**See calibration spreadsheet**
	Confirm (in raw data) that an initial calibration occurs at the required frequency.	**Yes**	
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**ethylbenzene Reported 0.6245**	**Calculated RRF: 50 ppb std 287635/460579=0.624507**
			Calculated RRF: See calibration spreadsheet
			Calculated %RSD: See calibration spreadsheet

Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation.

SHOW ALL WORK FOR RECALCULATIONS

Tune	Confirm BFB Percent Relative Abundance	**06/22/2021 08:09 mass 50 reported 26.5%**	**5980/22544*100=26.526%**

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201178-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
ICV	Check result	**CMS19 10/9/2020 19:35**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %R		
A CCV applicable to our samples	Check result	**CMS19 6/22/2021 08:56**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %D		
Method Blank	Check result	**605374 (All ND)**	
Surrogate	Recalculate one %R	**6/22/10:58 RCF-DR-1 toluene-d8 reported 105%**	**52.5/50*100=105%**
MS	Check result	**N/A**	
	Recalculate one %R		
MSD	Check result	**N/A**	
	Recalculate one %R		
	Recalculate one RPD value between MS and MSD		

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201178-1_8260B

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
LCS	Check result	**605374 6/22/2021 09:49**	**See calibration spreadsheet.**
	Recalculate one %R	**ethylbenzene reported 93%**	**46.5/50*100=93.0%**
LCSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between LCS and LCSD	**N/A**	
Internal Standards	Recalculate one %R	**fluorobenze RCF-DR-1**	**811584/892947*100=90.9%**
	Recalculate one delta RT	**fluorobenze RCF-DR-1**	**7.13-7.13=0.00 min.**
Sample Result for ethylbenzene	Check result		**See calibration spreadsheet**
MDL for __RCF-DR-1__ethylbenzene	Check result	**reported 0.00018 mg/L**	**nominal MDL 0.00018 mg/L**
RL for __RCF-DR-1__ethylbenzene	Check result	**reported 0.00050 mg/L**	**nominal RL 0.00050 mg/L**
Convert µg/m^3 to ppbV (air only) for	Check result	**N/A**	

ICAL CMS19 10/9/2020
ethylbenzene

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
0.3	1358	50.0	422857	0.16
0.5	2473	50.0	460092	0.27
1.0	5381	50.0	414632	0.65
2.0	11904	50.0	510111	1.17
5.0	29984	50.0	481869	3.11
20.0	127125	50.0	487720	13.03
50.0	287635	50.0	460579	31.23
100.0	546751	50.0	451127	60.60
150.0	846422	50.0	467101	90.60
200.0	1183564	50.0	498705	118.66

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	5.06%	4.93%	0.10%	7.13%	-255.55%	-32.82%
	-12.08%	-12.14%	-14.13%	-10.35%	-141.52%	-31.95%
	6.14%	6.13%	5.87%	8.23%	-57.07%	-5.41%
	-4.58%	-4.57%	-4.20%	-2.69%	-35.14%	-11.44%
	1.78%	1.80%	2.70%	3.79%	-8.89%	-2.53%
	6.58%	6.61%	7.80%	8.69%	5.90%	3.93%
	2.15%	2.18%	3.36%	4.16%	3.33%	0.68%
	-0.88%	-0.85%	0.31%	1.07%	0.88%	-0.87%
	-1.20%	-1.17%	-0.01%	0.75%	0.77%	0.30%
RSE in X:	5.7%	6.0%	6.5%	6.2%	106.0%	18.3%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r^2	r
Weighted (1/Amt^2)						
Average		6.1138E-01		0	0.99942	0.99971
Linear	2.4235E-04	6.1119E-01		0.00	0.99909	0.99955
Weighted (1/Amt)						
Linear	9.4208E-03	6.0404E-01		-0.02	0.99961	0.99980
Unweighted						
Forced Zero		5.9954E-01		0	0.99981	0.99991
Linear	3.9266E-01	5.9679E-01		-0.66	0.99976	0.99988
Quadratic	5.5123E-02	6.2792E-01	-1.7343E-04	-0.09	0.99996	0.99998
	c	b	a			

Sample Results

	ICV	CCV	LCS	RCF-DR-1	Sample 5
Instrum.Responses:	276300	377744	389460	2079	
IS Response:	441385	641754	684933	551144	
Avg RF Result:	51.194	48.138	46.502	0.308	#DIV/0!
Linear(1/x2) Result:	51.210	48.152	46.516	0.308	#DIV/0!
Linear(1/x) Result:	51.801	48.707	47.052	0.297	#DIV/0!
Linear Forced:	52.205	49.088	47.420	0.315	#DIV/0!
Linear Result:	51.788	48.657	46.981	-0.342	#DIV/0!
Quad Result (no IS):					
Quad Result (with IS):	50.462	47.403	45.768	0.213	#DIV/0!

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 500-201158-1-Mod 537

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
Initial Calibration	Confirm (in raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).	**Instrument A13** **6/15/2021** **12:31-13:28** **7-point calibration**	**See calibration spreadsheet**
	Confirm (in raw data) that an initial calibration occurs at the required frequency.	**Yes**	
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.		**Calculated RRF: See calibration spreadsheet**
			Calculated $\overline{RRF}$: See calibration spreadsheet
			Calculated %RSD: See calibration spreadsheet
Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation. **SHOW ALL WORK FOR RECALCULATIONS**			
Tune	Confirm DFTPP Percent Relative Abundance	**N/A**	

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: __500-201158-1-Mod 537

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
ICV	Check result	**6/15/2021 13:47**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %R		
A CCV applicable to our samples	Check result	**6/19/2021 16:57**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %D		
Method Blank	Check result	**6/19/2021 18:31**	**ND**
Surrogate	Recalculate one %R	**RCF-TR-1-210618 6/20/2021 18:10**	**M262FTS reported 125% 0.1482/0.119*100=125%**
MS	Check result	**N/A**	
	Recalculate one %R	**N/A**	
MSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between MS and MSD	**N/A**	

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: __500-201158-1-Mod 537

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
LCS	Check result	**6/19/2021 18:40**	**See calibration spreadsheet.**
	Recalculate one %R	**PFHxA reported 2.0%**	**2.0/2.0*100=100%**
LCSD	Check result	**N/A**	
	Recalculate one %R	**N/A**	
	Recalculate one RPD value between LCS and LCSD	**N/A**	
Internal Standards	Recalculate one %R	**13PFOA**	**356980*10/3644847*100=97.9%**
	Recalculate one delta RT	**13PFOA**	**3.93-3.93=0.00 min. difference**
Sample Result for 6:2 FTS	Check result	**RCF-TR-1-210618 6/20/2021 18:10 10X**	**(2.17 quant sheet) (10 fv/((0.1.17gm)(0.634434%solid)))*10 = 292 ug/kg**
MDL for __6:2 FTS	Check result	**reported 10 ug/Kg**	**nominal MDL 0.15 ug/Kg 0.15*10*1/0.7423 (1.17gm(%solid 0.6344))=2.02 ug/Kg**
RL for __6:2 FTS_____	Check result	**reported 130 ug/Kg**	**nominal RL 2.0 ug/Kg 2.0*10*1(1.17gm(%solid 0.6344))=14.8 ug/Kg**
Convert µg/m^3 to ppbV (air only) for _____	Check result	**N/A**	

537	
6:2 FTS	water

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
0.0237	54201	1.19	803880	0.08
0.0474	89218	1.19	802066	0.13
0.2370	423651	1.19	791831	0.64
0.9480	1516755	1.19	744600	2.42
2.3700	3664970	1.19	683175	6.38
4.7400	5780714	1.19	546077	12.60
9.4800	9327498	1.19	445549	24.91

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	22.15%	3.13%	6.72%	28.42%	-16.79%	46.58%
	0.76%	-6.27%	-4.94%	5.94%	-16.60%	14.15%
	-3.07%	0.33%	-0.31%	1.91%	-2.47%	1.92%
	-7.74%	-2.63%	-3.60%	-3.00%	-3.98%	-4.30%
	-2.81%	3.00%	1.90%	2.18%	1.89%	0.85%
	-4.11%	1.76%	0.65%	0.82%	0.75%	-0.02%
	-5.18%	0.68%	-0.42%	-0.31%	-0.26%	-0.01%
RSE in X:	10.1%	3.7%	4.2%	12.0%	10.8%	24.5%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r^2	r
Weighted (1/Amt^2)						
Average		2.7715E+00		0	0.99731	0.99866
Linear	1.6485E-02	2.6083E+00		-0.01	0.99977	0.99989
Weighted (1/Amt)						
Linear	1.3519E-02	2.6377E+00		-0.01	0.99992	0.99996
Unweighted						
Forced Zero		2.6361E+00		0	0.99995	0.99998
Linear	2.8330E-02	2.6319E+00		-0.01	0.99993	0.99996
Quadratic	-1.3294E-02	2.6925E+00	-6.6478E-03	0.00	0.99997	0.99998
	c	b	a			

Sample Results

	-2	LCS	ICV	CCV	
Instrum.Responses:	4212684	917866	5344384	53939	
IS Response:	83398	431521	554380	524939	
Avg RF Result:	21.689	0.913	4.139	0.044	#DIV/0!
Linear(1/x2) Result:	23.039	0.964	4.392	0.041	#DIV/0!
Linear(1/x) Result:	22.784	0.955	4.344	0.041	#DIV/0!
Linear Forced:	22.803	0.960	4.352	0.046	#DIV/0!
Linear Result:	22.829	0.951	4.348	0.036	#DIV/0!
Quad Result (no IS):					
Quad Result (with IS):	23.719	0.947	4.312	0.050	#DIV/0!

(2.17 quant sheet) (10 fv/((0.1.17gm)(0.634434%solid)))*10 = 292 ug/kg reported 290 ug/kg

STAGE 3/4 DATA VALIDATION CHECKLIST FOR
RECALCULATIONS Data Package Number: 201178-1_8270D

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
Initial Calibration	Confirm (in raw data) that an initial calibration begins each analytical sequence, before all QC or env. samples are analyzed, using the correct number of standards (and calibration blank, if required).	**Instrument CMS21** **6/22/2021** **7-point calibration**	**See calibration spreadsheet**
	Confirm (in raw data) that an initial calibration occurs at the required frequency.	**Yes**	
	Confirm that initial calibration criteria are met. Spot-recalculate initial calibration results.	**Reported** **1.3351**	phenol Calculated RRF: 1 ppb std 96664*3.2/231692=1.33507
			Calculated RRF: See calibration spreadsheet
			Calculated %RSD: See calibration spreadsheet

Recalculate at least one result (and %R or %D values, as appropriate) from each of the following QC samples and environmental samples, and compare your calculated results with the results the laboratory reports on their summary forms found earlier in the data package. They should agree. If they do not, then there may be problems with the package and further review is required. Note that for some QC samples, your comparison may mean simply confirming that the result reported in the summary form matches the result in the raw data – there may not be any calculation.

SHOW ALL WORK FOR RECALCULATIONS

Tune	Confirm DFTPP Percent Relative Abundance	**06/22/2021 19:57** **mass 51 reported 41.8%**	**274240/655744*100=41.821%**

STAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201178-1_8270D

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
ICV	Check result	**CMS21 6/22/2021 12:59**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %R		
A CCV applicable to our samples	Check result	**CMS19 6/22/2021 20:21**	**See calibration spreadsheet**
	Recalculate one RRF		
	Recalculate one %D		
Method Blank	Check result	**605362 (All ND)**	
Surrogate	Recalculate one %R	**6/22/2021 MB phenol-d5 reported 54%**	**5.44/10*100=54.4%**
MS	Check result	**N/A**	
	Recalculate one %R		
MSD	Check result	**N/A**	
	Recalculate one %R		
	Recalculate one RPD value between MS and MSD		

SSTAGE 3/4 DATA VALIDATION CHECKLIST FOR RECALCULATIONS

Data Package Number: 201178-1_8270D

Validation Element	Objective	Sample ID, Run Date, and Run Time	Results (include units) and Notes (Use check mark to indicate correct result; include hand-calculated result if performed)
LCS	Check result	**605374 6/22/2021 20:48**	**See calibration spreadsheet.**
	Recalculate one %R	**phenol reported 60%**	**4.78/8.00*100=59.75%**
LCSD	Check result	**605374 6/22/2021 21:12**	**See calibration spreadsheet.**
	Recalculate one %R	**phenol reported 58%**	**4.62/8.00*100=57.75%**
	Recalculate one RPD value between LCS and LCSD	**phenol reported 3%**	**59.75-57.75/avg.58.75*100=3.404%**
Internal Standards	Recalculate one %R	**phenol-d5 RCF-DR-1**	**1008238/878292*100=115%%**
	Recalculate one delta RT	**phenol-d5 RCF-DR-1**	**14.22-14.24=-0.02 min.**
Sample Result for phenol	Check result		**See calibration spreadsheet**
MDL for __RCF-DR-1__phenol	Check result	**nominal MDL 0.00054 reported 0.029 mg/L**	**(10x dilution, 234.6 mL to 5 mL FV)=run factor of 53.28 0.00054*53.28=0.02877 mg/L**
RL for __RCF-DR-1__phenol	Check result	**nominal RL 0.0040 reported 0.21 mg/L**	**nominal RL 0.00050 mg/L 0.0040*53.28=0.213 mg/L**
Convert µg/m^3 to ppbV (air only) for	Check result	**N/A**	

ICAL CMS21 6/22/2021
phenol

Input Calibration Data

Amount	Response	ISTD Amt	ISTD Resp	Rel. Resp.
1.0	96664	3.2	231692	1.34
2.0	239519	3.2	272055	2.82
4.0	541563	3.2	294671	5.88
8.0	1162803	3.2	302156	12.31
10.0	1480882	3.2	303377	15.62
12.0	1818959	3.2	294447	19.77
14.0	2056268	3.2	297624	22.11

Relative Errors in X

	Average	Linear (1/x2)	Linear (1/X)	Linear Forced	Linear	Quadratic
	-11.35%	1.82%	4.80%	-15.75%	11.03%	5.98%
	-6.46%	-2.58%	-1.70%	-11.11%	0.96%	0.07%
	-2.37%	-3.22%	-3.41%	-7.22%	-2.56%	-1.74%
	2.21%	-1.14%	-1.90%	-2.86%	-1.97%	-1.15%
	3.72%	-0.17%	-1.04%	-1.43%	-1.31%	-0.85%
	9.39%	4.89%	3.87%	3.95%	3.44%	3.33%
	4.86%	0.40%	-0.61%	-0.35%	-1.09%	-1.53%
RSE in X:	7.1%	3.0%	3.4%	8.7%	5.4%	3.7%

Curve Fit Statistics

	Constant	1ST Degree Coefficient	2ND Degree Coefficient	X-Intercept	r^2	r
Weighted (1/Amt^2)						
Average		1.5060E+00		0	0.99667	0.99833
Linear	-2.8729E-01	1.5934E+00		0.18	0.99767	0.99883
Weighted (1/Amt)						
Linear	-3.5694E-01	1.6146E+00		0.22	0.99822	0.99911
Unweighted						
Forced Zero		1.5847E+00		0	0.99913	0.99956
Linear	-4.7565E-01	1.6309E+00		0.29	0.99832	0.99916
Quadratic	-3.2294E-01	1.5592E+00	4.9278E-03	0.21	0.99842	0.99921
	c	b	a			

Sample Results

	ICV	CCV	LCS	LCSD	RCF-DR-1
Instrum.Responses:	1415440	983934	634754	622194	80876
IS Response:	285164	284545	282092	286142	286019
Avg RF Result:	10.547	7.348	4.781	4.620	0.601
Linear(1/x2) Result:	10.149	7.125	4.699	4.547	0.748
Linear(1/x) Result:	10.059	7.074	4.681	4.531	0.781
Linear Forced:	10.023	6.983	4.544	4.391	0.571
Linear Result:	10.031	7.077	4.707	4.558	0.846
Quad Result (no IS):					
Quad Result (with IS):	10.073	7.143	4.754	4.603	0.785

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201178-1

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-DR-1-210619	537 (modified)	4:2 FTS	1.2	U	1.2	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	6:2 FTS	4900	E	13	25	ng/L	4900	J+
RCF-DR-1-210619	537 (modified)	8:2 FTS	2.3	U	2.3	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	DONA	2.0	U	2.0	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	F-53B Major	1.2	U	1.2	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	F-53B Minor	1.6	U *+	1.6	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	HFPO-DA (GenX)	7.5	U	7.5	20	ng/L	20	U
RCF-DR-1-210619	537 (modified)	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	6.5	U	6.5	25	ng/L	25	U
RCF-DR-1-210619	537 (modified)	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	6.0	U	6.0	25	ng/L	25	U
RCF-DR-1-210619	537 (modified)	Perfluorobutanesulfonic acid (PFBS)	87		1.0	10	ng/L	87	
RCF-DR-1-210619	537 (modified)	Perfluorobutanoic acid (PFBA)	89		12	25	ng/L	89	
RCF-DR-1-210619	537 (modified)	Perfluorodecanesulfonic acid (PFDS)	1.6	U	1.6	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluorodecanoic acid (PFDA)	1.6	U	1.6	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluorododecanoic acid (PFDoA)	2.8	U	2.8	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluoroheptanesulfonic Acid (PFHpS)	0.95	U	0.95	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluoroheptanoic acid (PFHpA)	21		1.3	10	ng/L	21	
RCF-DR-1-210619	537 (modified)	Perfluorohexanesulfonic acid (PFHxS)	2.9	U	2.9	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluorohexanoic acid (PFHxA)	580		2.9	10	ng/L	580	
RCF-DR-1-210619	537 (modified)	Perfluorononanesulfonic acid (PFNS)	1.9	U	1.9	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluorononanoic acid (PFNA)	1.4	U	1.4	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluorooctanesulfonamide (FOSA)	4.9	U	4.9	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluorooctanesulfonic acid (PFOS)	11		2.7	10	ng/L	11	
RCF-DR-1-210619	537 (modified)	Perfluorooctanoic acid (PFOA)	5.3	J	4.3	10	ng/L	5.3	J
RCF-DR-1-210619	537 (modified)	Perfluoropentanesulfonic acid (PFPeS)	1.5	U	1.5	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluoropentanoic acid (PFPeA)	210		2.5	10	ng/L	210	
RCF-DR-1-210619	537 (modified)	Perfluorotetradecanoic acid (PFTeA)	3.7	U	3.7	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluorotridecanoic acid (PFTriA)	6.5	U	6.5	10	ng/L	10	U
RCF-DR-1-210619	537 (modified)	Perfluoroundecanoic acid (PFUnA)	5.5	U	5.5	10	ng/L	10	U
RCF-DR-1-210619	6020A	Aluminum	0.21		0.025	0.10	mg/L	0.21	
RCF-DR-1-210619	6020A	Antimony	0.070		0.0013	0.0030	mg/L	0.070	
RCF-DR-1-210619	6020A	Arsenic	0.0070		0.00023	0.0010	mg/L	0.0070	
RCF-DR-1-210619	6020A	Barium	0.29		0.00073	0.0025	mg/L	0.29	
RCF-DR-1-210619	6020A	Beryllium	0.00053	U	0.00053	0.0010	mg/L	0.0010	U
RCF-DR-1-210619	6020A	Cadmium	0.0013		0.00017	0.00050	mg/L	0.0013	J+
RCF-DR-1-210619	6020A	Calcium	230		0.044	0.20	mg/L	230	
RCF-DR-1-210619	6020A	Chromium	0.028		0.0011	0.0050	mg/L	0.028	
RCF-DR-1-210619	6020A	Cobalt	0.020		0.00040	0.0010	mg/L	0.020	
RCF-DR-1-210619	6020A	Copper	0.030		0.00050	0.0020	mg/L	0.030	

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
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Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-DR-1-210619	6020A	Iron	1.1		0.047	0.10	mg/L	1.1	
RCF-DR-1-210619	6020A	Lead	0.013		0.00019	0.00050	mg/L	0.013	
RCF-DR-1-210619	6020A	Lithium	6.5		0.0025	0.010	mg/L	6.5	
RCF-DR-1-210619	6020A	Magnesium	54		0.049	0.20	mg/L	54	
RCF-DR-1-210619	6020A	Manganese	1.3		0.00079	0.0025	mg/L	1.3	
RCF-DR-1-210619	6020A	Nickel	0.021		0.00063	0.0020	mg/L	0.021	
RCF-DR-1-210619	6020A	Potassium	110		0.11	0.50	mg/L	110	
RCF-DR-1-210619	6020A	Selenium	0.0020	J	0.00098	0.0025	mg/L	0.0020	J
RCF-DR-1-210619	6020A	Silver	0.00017	J	0.00012	0.00050	mg/L	0.00017	J
RCF-DR-1-210619	6020A	Sodium	160		0.077	0.20	mg/L	160	
RCF-DR-1-210619	6020A	Thallium	0.00057	U	0.00057	0.0020	mg/L	0.0020	U
RCF-DR-1-210619	6020A	Vanadium	0.0073		0.0022	0.0050	mg/L	0.0073	
RCF-DR-1-210619	6020A	Zinc	0.21		0.0069	0.020	mg/L	0.21	
RCF-DR-1-210619	7470A	Mercury	0.00049	U	0.00049	0.0010	mg/L	0.0010	U
RCF-DR-1-210619	8260B	.alpha.-Methylstyrene	0.056	T J N			mg/L	0.056	NJ
RCF-DR-1-210619	8260B	1,1,1-Trichloroethane	0.00038	U	0.00038	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,1,2,2-Tetrachloroethane	0.00040	U	0.00040	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,1,2-Trichloro-1,2,2-trifluoroethane	0.00046	U	0.00046	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,1,2-Trichloroethane	0.00035	U	0.00035	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,1-Dichloroethane	0.00041	U	0.00041	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,1-Dichloroethene	0.00039	U	0.00039	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,2,4-Trichlorobenzene	0.00034	U	0.00034	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,2-Dibromo-3-Chloropropane	0.0020	U *-	0.0020	0.0050	mg/L	0.0050	UJ
RCF-DR-1-210619	8260B	1,2-Dibromoethane	0.00039	U	0.00039	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,2-Dichlorobenzene	0.00033	U	0.00033	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,2-Dichloroethane	0.00039	U	0.00039	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,2-Dichloropropane	0.00043	U	0.00043	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,3-Dichlorobenzene	0.00040	U	0.00040	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	1,4-Dichlorobenzene	0.00036	U	0.00036	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	2-Hexanone	0.013		0.0016	0.0050	mg/L	0.013	J-
RCF-DR-1-210619	8260B	7-Tetradecene	0.011	T J N			mg/L	0.011	NJ
RCF-DR-1-210619	8260B	Acetaldehyde	0.76	T J N			mg/L	0.76	NJ
RCF-DR-1-210619	8260B	Acetone	0.20		0.0087	0.050	mg/L	0.20	J-
RCF-DR-1-210619	8260B	Benzene	0.0019		0.00015	0.00050	mg/L	0.0019	J-
RCF-DR-1-210619	8260B	Benzene, (1-methylpropyl)-	0.032	T J N			mg/L	0.032	NJ
RCF-DR-1-210619	8260B	Benzene, tert-butyl-	0.033	T J N			mg/L	0.033	NJ
RCF-DR-1-210619	8260B	Bromodichloromethane	0.00037	U	0.00037	0.0010	mg/L	0.0010	UJ

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Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-DR-1-210619	8260B	Bromoform	0.00048	U	0.00048	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Bromomethane	0.00080	U	0.00080	0.0030	mg/L	0.0030	UJ
RCF-DR-1-210619	8260B	Carbon disulfide	0.0095		0.00045	0.0020	mg/L	0.0095	J-
RCF-DR-1-210619	8260B	Carbon tetrachloride	0.00038	U	0.00038	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Chlorobenzene	0.00039	U	0.00039	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Chloroethane	0.00051	U	0.00051	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Chloroform	0.00037	U	0.00037	0.0020	mg/L	0.0020	UJ
RCF-DR-1-210619	8260B	Chloromethane	0.00032	U	0.00032	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	cis-1,2-Dichloroethene	0.00041	U	0.00041	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	cis-1,3-Dichloropropene	0.00042	U	0.00042	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Cyclohexane	0.00049	U	0.00049	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Dibromochloromethane	0.00049	U	0.00049	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Dichlorodifluoromethane	0.00067	U	0.00067	0.0030	mg/L	0.0030	UJ
RCF-DR-1-210619	8260B	Ethanol	0.14	T J N			mg/L	0.14	NJ
RCF-DR-1-210619	8260B	Ethylbenzene	0.00031	J	0.00018	0.00050	mg/L	0.00031	J-
RCF-DR-1-210619	8260B	Isopropylbenzene	0.0086		0.00039	0.0010	mg/L	0.0086	J-
RCF-DR-1-210619	8260B	Methyl acetate	0.079		0.0020	0.0050	mg/L	0.079	J-
RCF-DR-1-210619	8260B	Methyl Ethyl Ketone	0.057		0.0021	0.0050	mg/L	0.057	J-
RCF-DR-1-210619	8260B	methyl isobutyl ketone	0.0037	J	0.0022	0.0050	mg/L	0.0037	J-
RCF-DR-1-210619	8260B	Methyl tert-butyl ether	0.00039	U	0.00039	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Methylcyclohexane	0.00032	U	0.00032	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Methylene Chloride	0.0016	U	0.0016	0.0050	mg/L	0.0050	UJ
RCF-DR-1-210619	8260B	Styrene	0.00039	U	0.00039	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Tentatively Identified Compound	None				mg/L	None	
RCF-DR-1-210619	8260B	Tetrachloroethene	0.00037	U	0.00037	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Toluene	0.00048	J	0.00015	0.00050	mg/L	0.00048	J-
RCF-DR-1-210619	8260B	trans-1,2-Dichloroethene	0.00035	U	0.00035	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	trans-1,3-Dichloropropene	0.00036	U	0.00036	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Trichloroethene	0.00016	U	0.00016	0.00050	mg/L	0.00050	UJ
RCF-DR-1-210619	8260B	Trichlorofluoromethane	0.00043	U	0.00043	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Unknown	0.018	T J			mg/L	0.018	J
RCF-DR-1-210619	8260B	Unknown	0.0064	T J			mg/L	0.0064	J
RCF-DR-1-210619	8260B	Vinyl chloride	0.00020	U	0.00020	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8260B	Xylenes, Total	0.00022	U	0.00022	0.0010	mg/L	0.0010	UJ
RCF-DR-1-210619	8270D	1,1'-Biphenyl	0.015	U	0.015	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	2,2'-oxybis[1-chloropropane]	0.016	U	0.016	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	2,4,5-Trichlorophenol	0.11	U	0.11	0.43	mg/L	0.43	U

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Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-DR-1-210619	8270D	2,4,6-Trichlorophenol	0.031	U	0.031	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	2,4-Dichlorophenol	0.11	U	0.11	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	2,4-Dimethylphenol	0.077	U	0.077	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	2,4-Dinitrophenol	0.37	U	0.37	0.85	mg/L	0.85	U
RCF-DR-1-210619	8270D	2,4-Dinitrotoluene	0.010	U	0.010	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	2,6-Dinitrotoluene	0.0031	U	0.0031	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	2-Chloronaphthalene	0.010	U	0.010	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	2-Chlorophenol	0.024	U	0.024	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	2-Methylnaphthalene	0.0028	U	0.0028	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	2-Methylphenol	0.013	U	0.013	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	2-Nitroaniline	0.055	U	0.055	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	2-Nitrophenol	0.11	U	0.11	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	3 & 4 Methylphenol	0.019	U	0.019	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	3,3'-Dichlorobenzidine	0.073	U	0.073	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	3-Nitroaniline	0.076	U	0.076	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	3-Tetradecene, (Z)-	3.3	T J N			mg/L	3.3	NJ
RCF-DR-1-210619	8270D	4,6-Dinitro-2-methylphenol	0.25	U	0.25	0.85	mg/L	0.85	U
RCF-DR-1-210619	8270D	4-Bromophenyl phenyl ether	0.023	U	0.023	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	4-Chloro-3-methylphenol	0.098	U	0.098	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	4-Chloroaniline	0.086	U	0.086	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	4-Chlorophenyl phenyl ether	0.027	U	0.027	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	4-Nitroaniline	0.071	U	0.071	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	4-Nitrophenol	0.32	U	0.32	0.85	mg/L	0.85	U
RCF-DR-1-210619	8270D	5-Tetradecene, (E)-	7.0	T J N			mg/L	7.0	NJ
RCF-DR-1-210619	8270D	Acenaphthene	0.013	U	0.013	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	Acenaphthylene	0.011	U	0.011	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	Acetophenone	0.081	J	0.028	0.21	mg/L	0.081	J
RCF-DR-1-210619	8270D	Anthracene	0.014	U	0.014	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	Atrazine	0.027	U	0.027	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	Benzaldehyde	0.64	U	0.64	1.7	mg/L	1.7	R
RCF-DR-1-210619	8270D	Benzo[a]anthracene	0.0024	U	0.0024	0.0085	mg/L	0.0085	U
RCF-DR-1-210619	8270D	Benzo[a]pyrene	0.0042	U *3	0.0042	0.0085	mg/L	0.0085	UJ
RCF-DR-1-210619	8270D	Benzo[b]fluoranthene	0.0034	U *3	0.0034	0.0085	mg/L	0.0085	UJ
RCF-DR-1-210619	8270D	Benzo[g,h,i]perylene	0.016	U *3	0.016	0.043	mg/L	0.043	UJ
RCF-DR-1-210619	8270D	Benzo[k]fluoranthene	0.0027	U *3	0.0027	0.0085	mg/L	0.0085	UJ
RCF-DR-1-210619	8270D	Benzoic acid, p-tert-butyl-	1.5	T J N			mg/L	1.5	NJ
RCF-DR-1-210619	8270D	Bis(2-chloroethoxy)methane	0.012	U	0.012	0.085	mg/L	0.085	U

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
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Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-DR-1-210619	8270D	Bis(2-chloroethyl)ether	0.012	U	0.012	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	Bis(2-ethylhexyl) phthalate	0.073	U	0.073	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	Butyl benzyl phthalate	0.020	U	0.020	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	Caprolactam	0.063	U	0.063	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	Carbazole	0.015	U	0.015	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	Chrysene	0.0029	U	0.0029	0.0085	mg/L	0.0085	U
RCF-DR-1-210619	8270D	Dibenz(a,h)anthracene	0.0022	U *3	0.0022	0.013	mg/L	0.013	UJ
RCF-DR-1-210619	8270D	Dibenzofuran	0.011	U	0.011	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	Diethyl phthalate	0.015	U	0.015	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	Dimethyl phthalate	0.013	U	0.013	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	Di-n-butyl phthalate	0.031	U	0.031	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	Di-n-octyl phthalate	0.045	U	0.045	0.43	mg/L	0.43	U
RCF-DR-1-210619	8270D	Fluoranthene	0.019	U	0.019	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	Fluorene	0.010	U	0.010	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	Hexachlorobenzene	0.0034	U	0.0034	0.021	mg/L	0.021	U
RCF-DR-1-210619	8270D	Hexachlorobutadiene	0.022	U	0.022	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	Hexachlorocyclopentadiene	0.27	U	0.27	0.85	mg/L	0.85	U
RCF-DR-1-210619	8270D	Hexachloroethane	0.026	U	0.026	0.21	mg/L	0.21	U
RCF-DR-1-210619	8270D	Indeno[1,2,3-cd]pyrene	0.0032	U *3	0.0032	0.0085	mg/L	0.0085	UJ
RCF-DR-1-210619	8270D	Isophorone	0.016	U	0.016	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	Naphthalene	0.013	U	0.013	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	Nitrobenzene	0.019	U	0.019	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	N-Nitrosodi-n-propylamine	0.0066	U	0.0066	0.021	mg/L	0.021	U
RCF-DR-1-210619	8270D	N-Nitrosodiphenylamine	0.016	U	0.016	0.085	mg/L	0.085	U
RCF-DR-1-210619	8270D	Pentachlorophenol	0.17	U	0.17	0.85	mg/L	0.85	U
RCF-DR-1-210619	8270D	Phenanthrene	0.013	U	0.013	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	Phenol	0.13	J	0.029	0.21	mg/L	0.13	J
RCF-DR-1-210619	8270D	Pyrene	0.018	U	0.018	0.043	mg/L	0.043	U
RCF-DR-1-210619	8270D	Tetradecane	2.8	T J N			mg/L	2.8	NJ
RCF-DR-1-210619	8270D	Unknown	6.7	T J			mg/L	6.7	J
RCF-DR-1-210619	8270D	Unknown	5.8	T J			mg/L	5.8	J
RCF-DR-1-210619	8270D	Unknown	1.5	T J			mg/L	1.5	J
RCF-DR-1-210619	8270D	Unknown	10	T J			mg/L	10	J
RCF-DR-1-210619	8270D	Unknown	1.8	T J			mg/L	1.8	J
RCF-DR-1-210619	8270D	Unknown	20	T J			mg/L	20	J
RCF-FB-2-210619	537 (modified)	4:2 FTS	0.20	U	0.20	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	6:2 FTS	2.1	U	2.1	4.3	ng/L	4.3	U

CHEMTOOL FIRE SITE - RS WATER ANALYTICAL RESULTS SUMMARY
EUROFINS TESTAMERICA REPORT NO. 500-201178-1

Sample ID	Method	Analyte	Lab Result	Lab Qual	MDL	RL	Units	Val_Result	Val_Qual
RCF-FB-2-210619	537 (modified)	8:2 FTS	0.39	U	0.39	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	DONA	0.34	U	0.34	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	F-53B Major	0.20	U	0.20	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	F-53B Minor	0.27	U *+	0.27	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	HFPO-DA (GenX)	1.3	U	1.3	3.4	ng/L	3.4	U
RCF-FB-2-210619	537 (modified)	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.1	U	1.1	4.3	ng/L	4.3	U
RCF-FB-2-210619	537 (modified)	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	1.0	U	1.0	4.3	ng/L	4.3	U
RCF-FB-2-210619	537 (modified)	Perfluorobutanesulfonic acid (PFBS)	0.17	U	0.17	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorobutanoic acid (PFBA)	2.0	U	2.0	4.3	ng/L	4.3	U
RCF-FB-2-210619	537 (modified)	Perfluorodecanesulfonic acid (PFDS)	0.27	U	0.27	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorodecanoic acid (PFDA)	0.26	U	0.26	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorododecanoic acid (PFDoA)	0.47	U	0.47	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluoroheptanesulfonic Acid (PFHpS)	0.16	U	0.16	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluoroheptanoic acid (PFHpA)	0.21	U	0.21	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorohexanesulfonic acid (PFHxS)	0.48	U	0.48	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorohexanoic acid (PFHxA)	0.49	U	0.49	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorononanesulfonic acid (PFNS)	0.31	U	0.31	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorononanoic acid (PFNA)	0.23	U	0.23	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorooctanesulfonamide (FOSA)	0.83	U	0.83	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorooctanesulfonic acid (PFOS)	0.46	U	0.46	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorooctanoic acid (PFOA)	0.72	U	0.72	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluoropentanesulfonic acid (PFPeS)	0.26	U	0.26	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluoropentanoic acid (PFPeA)	0.42	U	0.42	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorotetradecanoic acid (PFTeA)	0.62	U	0.62	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluorotridecanoic acid (PFTriA)	1.1	U	1.1	1.7	ng/L	1.7	U
RCF-FB-2-210619	537 (modified)	Perfluoroundecanoic acid (PFUnA)	0.94	U	0.94	1.7	ng/L	1.7	U